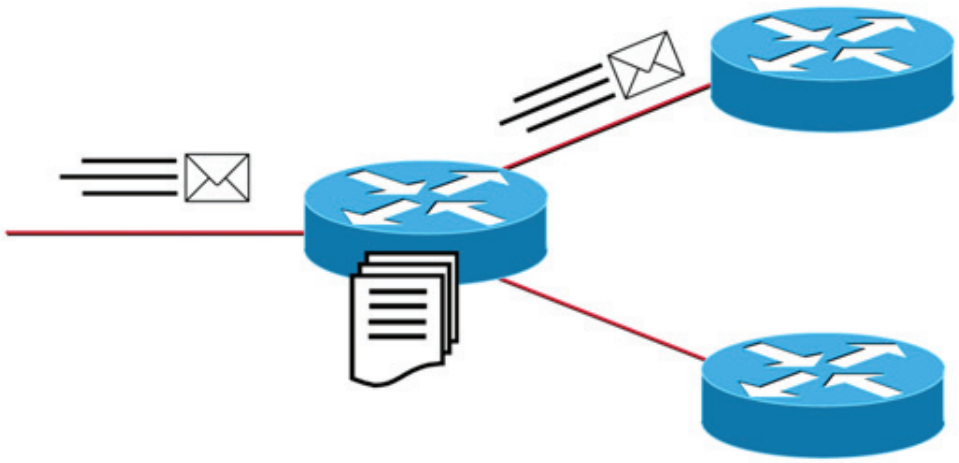
User Guide

Boson NetSim Overview

The Boson NetSim, which includes the Boson Router Simulator®, is a new category of simulation product. Many products simulate the end-user experience without actually emulating what is happening within the network. Boson's **Virtual Packet Technology** creates individual packets that are routed and switched through the simulated network, allowing the Boson NetSim to build an appropriate **Virtual Routing Table** for each protocol and, thus, fully emulate true networking. This technology allows for many uses of the Boson NetSim, far beyond the scope of the labs included in the program.



Achieving Cisco CCNA certification is the goal of many people who purchase this product. The Boson NetSim covers far more than just the full CCNA (640-801), ICND (640-811), and INTRO (641-821) subject matter. The included labs guide you through the configuration of routers and switches in a variety of scenarios. After completing a lab, you can ask the Boson NetSim to self-grade the lab to determine if you completed it correctly. As you progress through the labs, you will master the skills needed to be a CCNA. Because the Boson NetSim has the ability to guide and self-grade, using it can actually be more helpful than using real routers and switches. The Boson NetSim allows you to gain experience without having to purchase the equipment.

The Boson NetSim can also be used for many non-certification-oriented applications. The included full version of the **Network Designer** is a tool that allows you to design and plan a network. This tool's functionality goes beyond that of most tools because you can actually create the router configurations that are going to be used, save those configurations, and upload them to real routers.

Routing protocol implementation is one of the more challenging tasks you may encounter. The Boson NetSim allows you to create a **virtual pilot or test network** and compare the differences in the results before implementing a protocol like IGRP, EIGRP, RIP, or OSPF.

Troubleshooting a production network can be a frightening and frustrating experience. Fortunately, you can **create a virtual copy of your network** with the Boson Network Designer and troubleshoot the problems without interfering with your production network.

In summary, the Boson NetSim is a flexible and powerful product that can help you become certified and can aid you in the design and troubleshooting of complex networks.

An Overview of Using the Boson NetSim To Prepare for Your Certification

The Cisco certifications require you to learn and master a number of skills. This discussion will tell you how to incorporate the Boson NetSim as part of the learning process and how you can successfully complete your certification track by using the Boson NetSim.

Basically, mastering Cisco networking involves two fundamental tasks: learning the theory of routers and switches, and gaining the hands-on experience of implementing that theory by configuring the devices in a network and testing them in a lab. The theory can be learned by reading books or listening to an instructor. The purpose of the Boson NetSim is to help you with the practical hands-on portion of your education and to ensure that you not only understand the concepts of routing, but can actually configure and implement routing on Cisco devices.

Once you feel you have mastered both the theory and the practical labs, you can test your knowledge using the Boson ExSim practice exam products available at http://www.boson.com. Boson ExSim products include complex multiple-choice questions, drag-and-drop questions, and other types of simulation questions when appropriate.

The Boson NetSim is the most comprehensive product on the market for learning how to configure a Cisco router. The Boson NetSim will not only help you become certified, but it will actually help you learn and understand how to configure routers, switches, and networks.

Basic Lab Tutorial

Basic Simulator Features

After installing Boson NetSim, you can choose one of two ways to start the program. The first way is to double-click the Boson NetSim icon placed on your desktop during installation. The second way to start the Boson NetSim is through the Windows **Start** menu.

You must agree to be bound by the terms and conditions of the Single User License Agreement (SULA) to register, activate, or otherwise use any portion of the software.

Overview

This tutorial will guide you through the first lab, using the basic features of the Boson NetSim. It will show you how to select a lab, configure the devices, and then grade the lab. The first lab that you will complete is very simple, but following it will give you an understanding of the components of the Boson NetSim and how they interoperate. Advanced features and more functionality will be covered later.

Simulator Components

The Simulator is actually a suite of programs that interact to provide a total learning experience. The primary components are as follows:

1. Lab Navigator
2. Network Designer (optional)
3. Network Simulator
4. Lab Grader

The purpose of the Lab Navigator is to allow you to view, select, and begin the lab of your choice. The Lab Navigator provides a friendly interface for your learning experience.

The included Network Designer is a tool you can use to create your own custom networks. With this tool, you can build either a simple or complex network; you can even model an existing network. Note that the Network Designer is not required to complete the included labs. The Network Designer is provided solely to allow you to practice creating and administering your own Cisco networks.

The Network Simulator is the tool that actually simulates the network and routes virtual packets. This program allows you to control numerous devices and configure them as needed. The Network Simulator is not limited to performing only the tasks in the lab; it can do much, much more.

The Lab Grader analyzes the configuration you have completed and determines whether you have completed the lab correctly.

eLearning Lab Flow

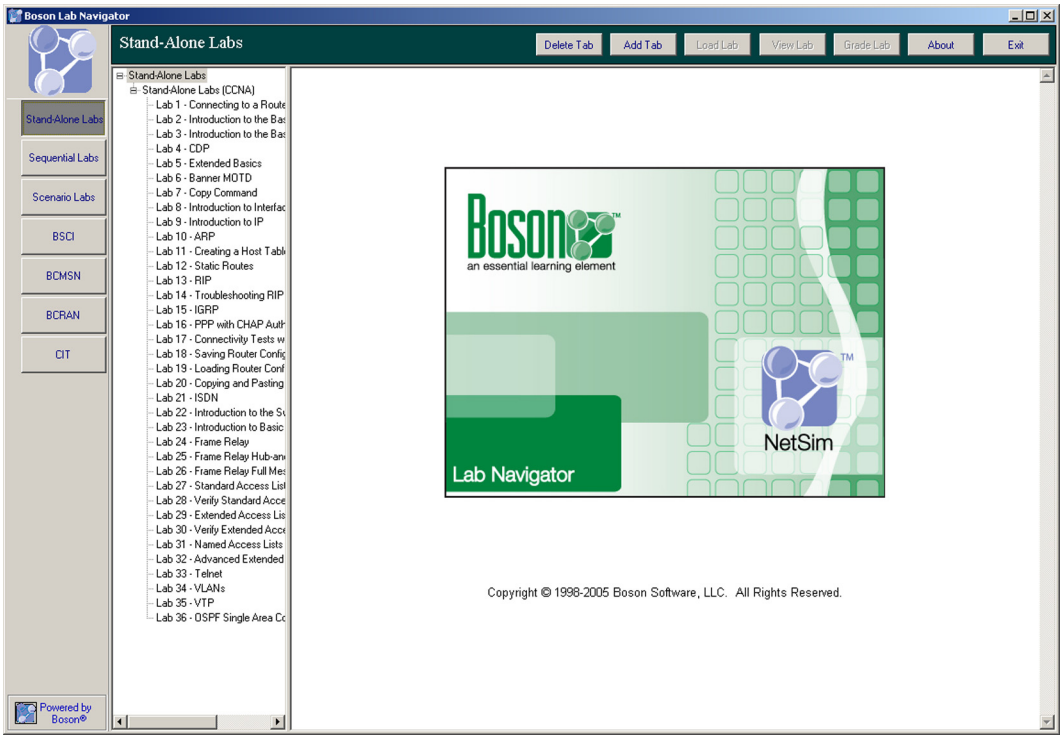
The three basic components involved in completing a lab are as follows:

1. Use the Lab Navigator to load the lab.
2. Use the Network Simulator to configure the devices (routers, switches, and stations).
3. Use the Lab Grader tool to check your lab answers (configs).

All three components described above will now be covered in detail.

Part 1: The Lab Navigator

When you open the program, you will encounter the first screen below. Each tab across the left side of the application represents a series of labs. Clicking on one of those tabs will reveal the lab topics in the middle window.


Boson Lab Navigator
Stand-Alone Labs
Delete Tab
Add Tab
Load Lab
View Lab
Grade Lab
About
Exit
Stand-Alone Labs
Sequential Labs
Scenario Labs
BSCI
BCMSN
BCRAN
CIT
Powered by Boson®
Stand-Alone Labs (CCNA)
Lab 1 - Connecting to a Route
Lab 2 - Introduction to the Bas
Lab 3 - Introduction to the Bas
Lab 4 - CDP
Lab 5 - Extended Basics
Lab 6 - Banner MOTD
Lab 7 - Copy Command
Lab 8 - Introduction to Interfac
Lab 9 - Introduction to IP
Lab 10 - ARP
Lab 11 - Creating a Host Tabl
Lab 12 - Static Routes
Lab 13 - RIP
Lab 14 - Troubleshooting RIP
Lab 15 - IGRP
Lab 16 - PPP with CHAP Auth
Lab 17 - Connectivity Tests w
Lab 18 - Saving Router Config
Lab 19 - Loading Router Conf
Lab 20 - Copying and Pasting
Lab 21 - ISDN
Lab 22 - Introduction to the S
Lab 23 - Introduction to Basic
Lab 24 - Frame Relay
Lab 25 - Frame Relay Hub-an
Lab 26 - Frame Relay Full Mes
Lab 27 - Standard Access List
Lab 28 - Verify Standard Acce
Lab 29 - Extended Access Lis
Lab 30 - Verify Extended Acc
Lab 31 - Named Access Lists
Lab 32 - Advanced Extended
Lab 33 - Telnet
Lab 34 - VLANs
Lab 35 - VTP
Lab 36 - OSPF Single Area Co
Boson
an essential learning element
NetSim
Lab Navigator
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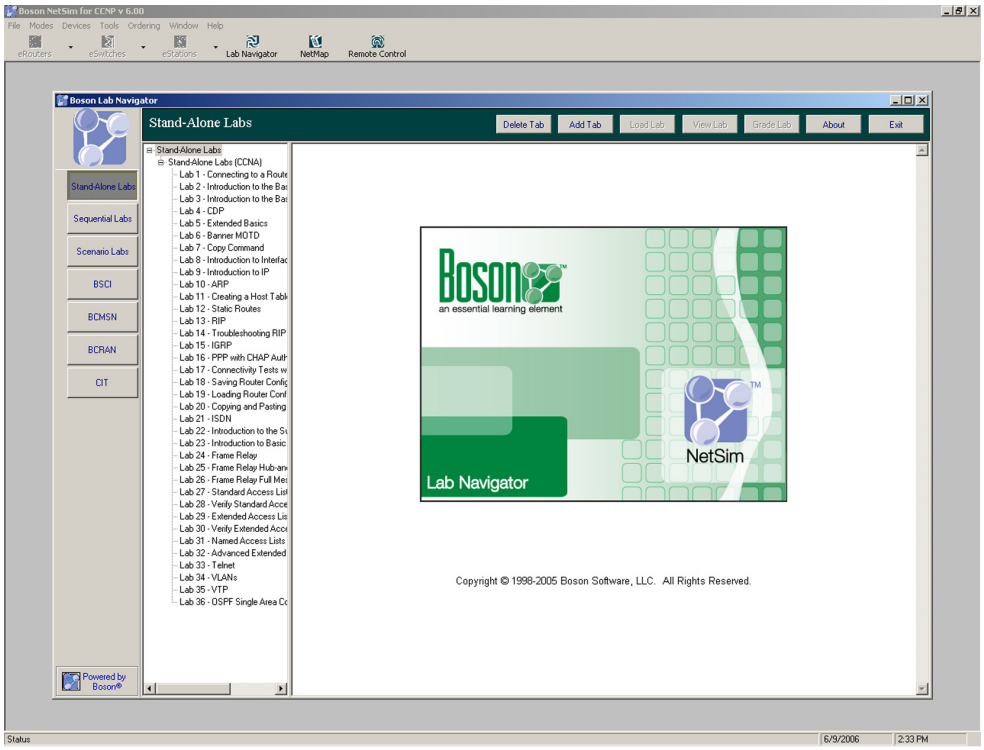
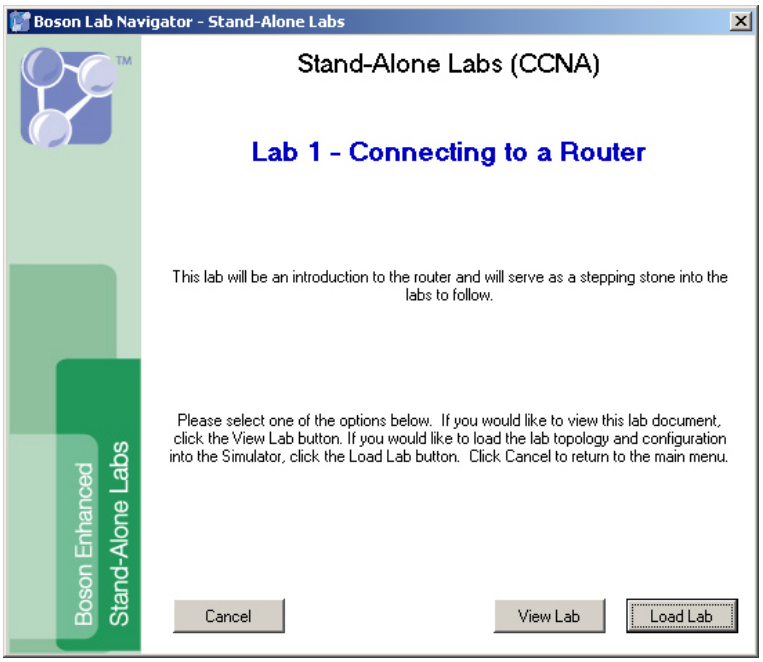
This is the initial Lab Navigator screen.

To get started with a lab, click the Stand-Alone Labs tab, and then select **Lab 1: Connecting to a Router**.



*Select the **Stand-Alone Labs** tab in the Lab Navigator.*

Double-click the name of the lab. You should see the following introductory screen, which provides a brief overview of the lab and gives you the options of viewing the lab instructions, loading the lab, or canceling.


Boson Lab Navigator - Stand-Alone Labs
Stand-Alone Labs (CCNA)
Lab 1 - Connecting to a Router
This lab will be an introduction to the router and will serve as a stepping stone into the labs to follow.
Please select one of the options below. If you would like to view this lab document, click the View Lab button. If you would like to load the lab topology and configuration into the Simulator, click the Load Lab button. Click Cancel to return to the main menu.
Boson Enhanced Stand-Alone Labs
Cancel
View Lab
Load Lab

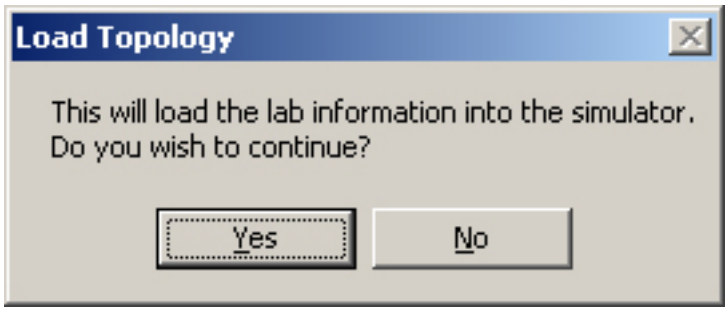
Starting a lab

View Lab

Clicking the **View Lab** button will open an Adobe Acrobat file containing the instructions for the lab that you selected. You can choose to print the lab at this time or follow along in the PDF.

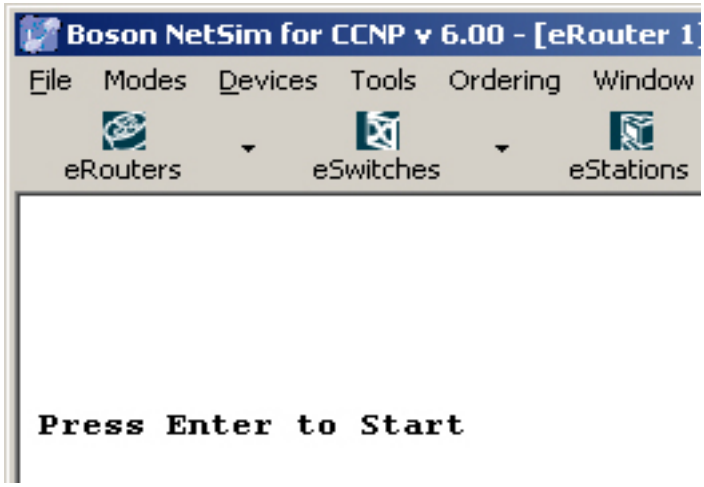
Load Lab

When you click the **Load Lab** button, you will be asked if you would like to load the corresponding topology into the Simulator. Answering **Yes** will display the Simulator in the background and create new windows, each of which represents a new device (e.g., a router, a switch, or a PC).



Part 2: The Network Simulator

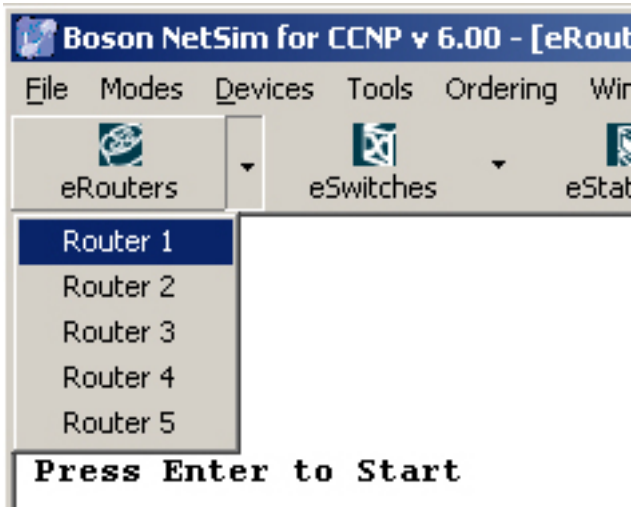
Once the lab is loaded, you will see the following screen:



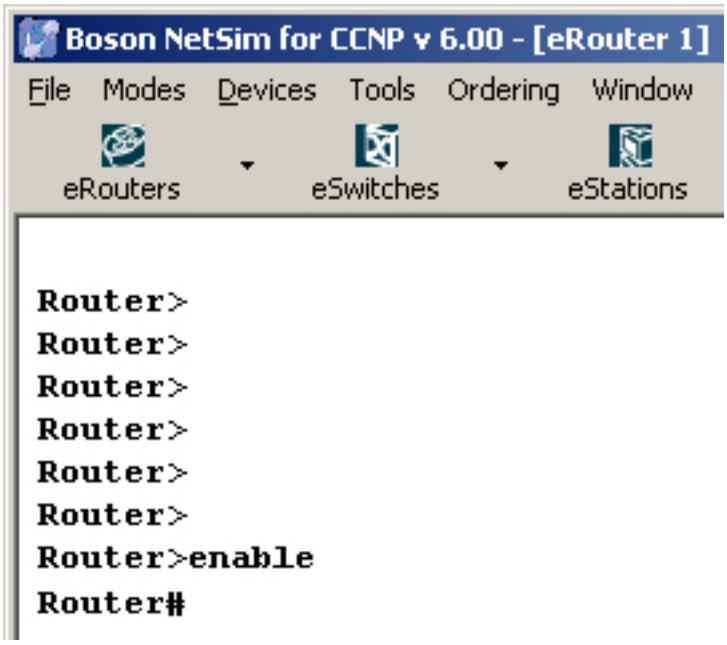
After this device prompt screen is displayed, you are ready to begin the lab.

Complete the lab as follows:

1. If you have not done so already, click the **eRouters** button located at the top of your screen, and select **Router 1**. The Router 1 interface will open, and the text "Press Enter to Start" will appear as shown in the following exhibit.



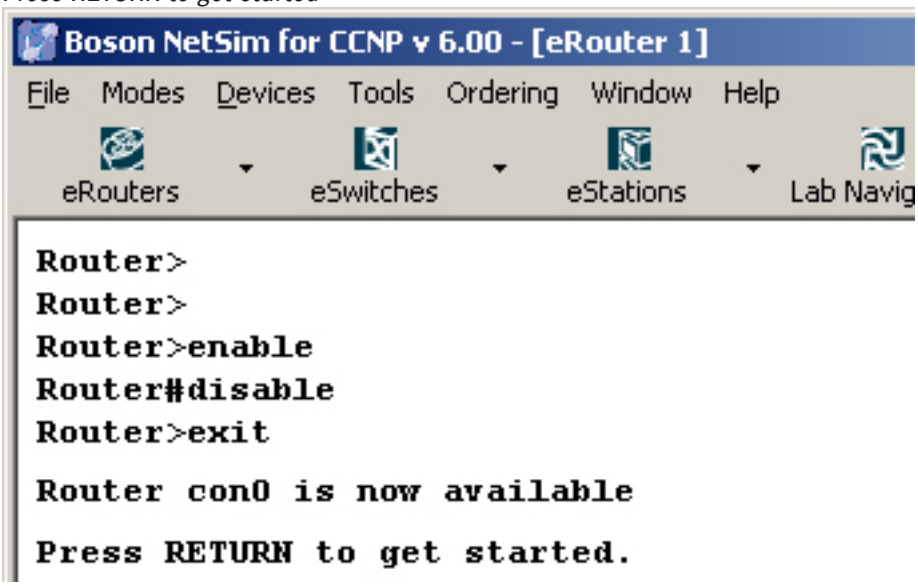
2. Click inside the Router 1 interface window, and press the ENTER key on your keyboard to get started. When you press the ENTER key, you connect to Router 1 and receive the *Router>* prompt. The prompt consists of two parts: the host name and the mode. **Router** is Router 1's original host name, and the **>** symbol indicates user EXEC mode.
3. Next, type the **enable** command to get to the privileged EXEC mode prompt (**Router#**). Your input appears in bold below:
   *Router>***enable**
   Router#



4. Finally, to return to user mode, simply type **disable**. From user mode, type **logout** or **exit** to leave the router. Your input appears in bold below:

*Router#***disable**
Router>
*Router>***exit**

Router con0 is now available
Press RETURN to get started



You have now completed all the steps in this introductory lab. To grade your lab, select the **Grade Lab** button on the top toolbar of the Lab Navigator.

Part 3: The Lab Grader

The Lab Grader is an easy-to-use tool for determining whether you have completed the tasks as defined in the lab. This is a useful tool to ensure you are mastering the skills required for your certification.

The three basic steps to use the Lab Grader:

1. Select the lab you have completed.
2. Tell the program to grade your lab.
3. Review the results.

Select the Lab

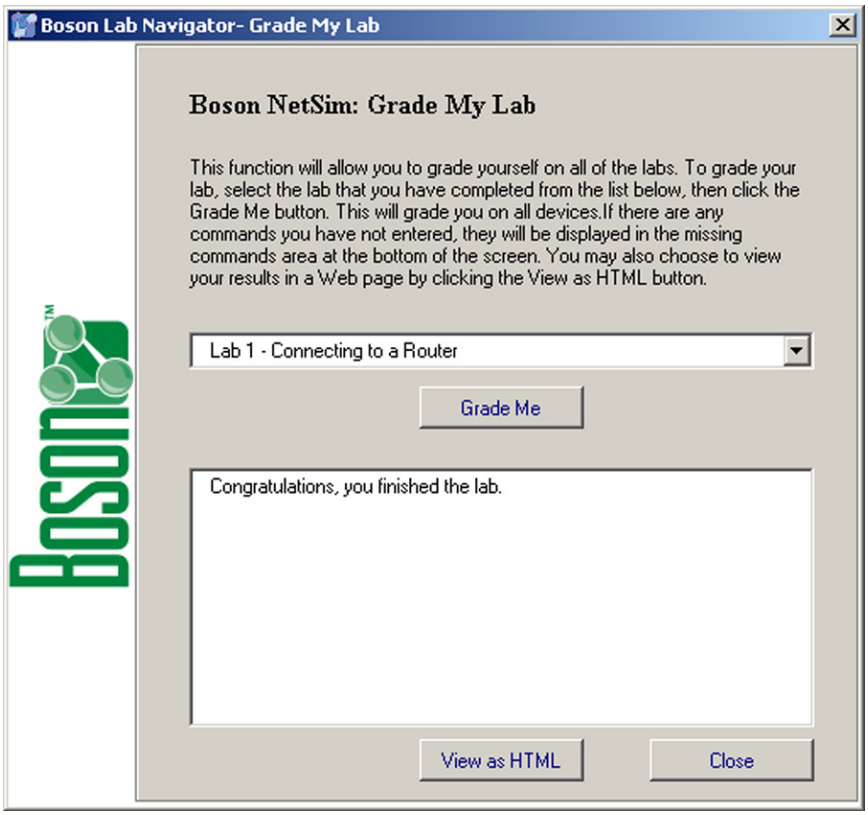
To select the lab you are working on, click the down arrow to the right of the drop-down box, and select the appropriate lab.

Grade the Lab

After you have selected the lab, click the **Grade Me** button. The program will then begin an analysis of your current router and switch configurations and compare them to the expected configuration of the devices.

Review Your Results

If you receive the same result as shown below, you have completed all necessary commands to accomplish the lab's objectives, and you are now ready to move on to the next lab. If not, you need to return to the lab, correct the errors, and grade the lab again.


Boson Lab Navigator- Grade My Lab
Boson NetSim: Grade My Lab
This function will allow you to grade yourself on all of the labs. To grade your lab, select the lab that you have completed from the list below, then click the Grade Me button. This will grade you on all devices.If there are any commands you have not entered, they will be displayed in the missing commands area at the bottom of the screen. You may also choose to view your results in a Web page by clicking the View as HTML button.
Lab 1 - Connecting to a Router
Grade Me
Congratulations, you finished the lab.
View as HTML
Close

The Lab Grader results

At this point, you have completed the Basic Lab Tutorial and are ready to move on to the Advanced Lab Tutorial in the next section.

Advanced Lab Tutorial

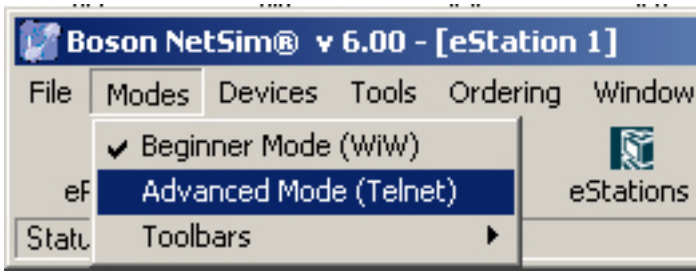
This tutorial will demonstrate the Boson NetSim's Advanced mode. These advanced features are optional, and you do not have to use the advanced Simulator features to properly complete the labs or prepare for your certification. However, the Advanced mode will teach you valuable skills that will aid you in the field and in the real world. Otherwise, you can complete this lab using the basic functionality of the Simulator as described in the previous section.

Step 1: Launch the Simulator

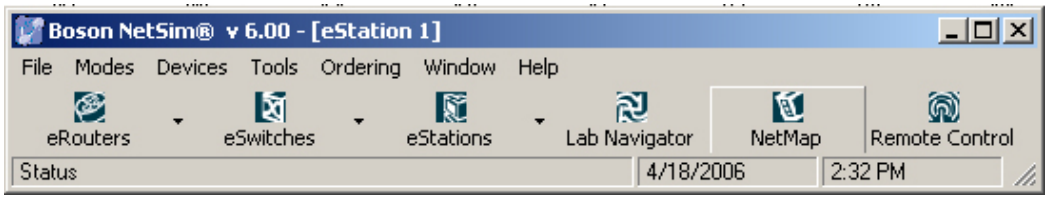
To get started, launch the Boson NetSim.

Step 2: Set Advanced Mode (Telnet)

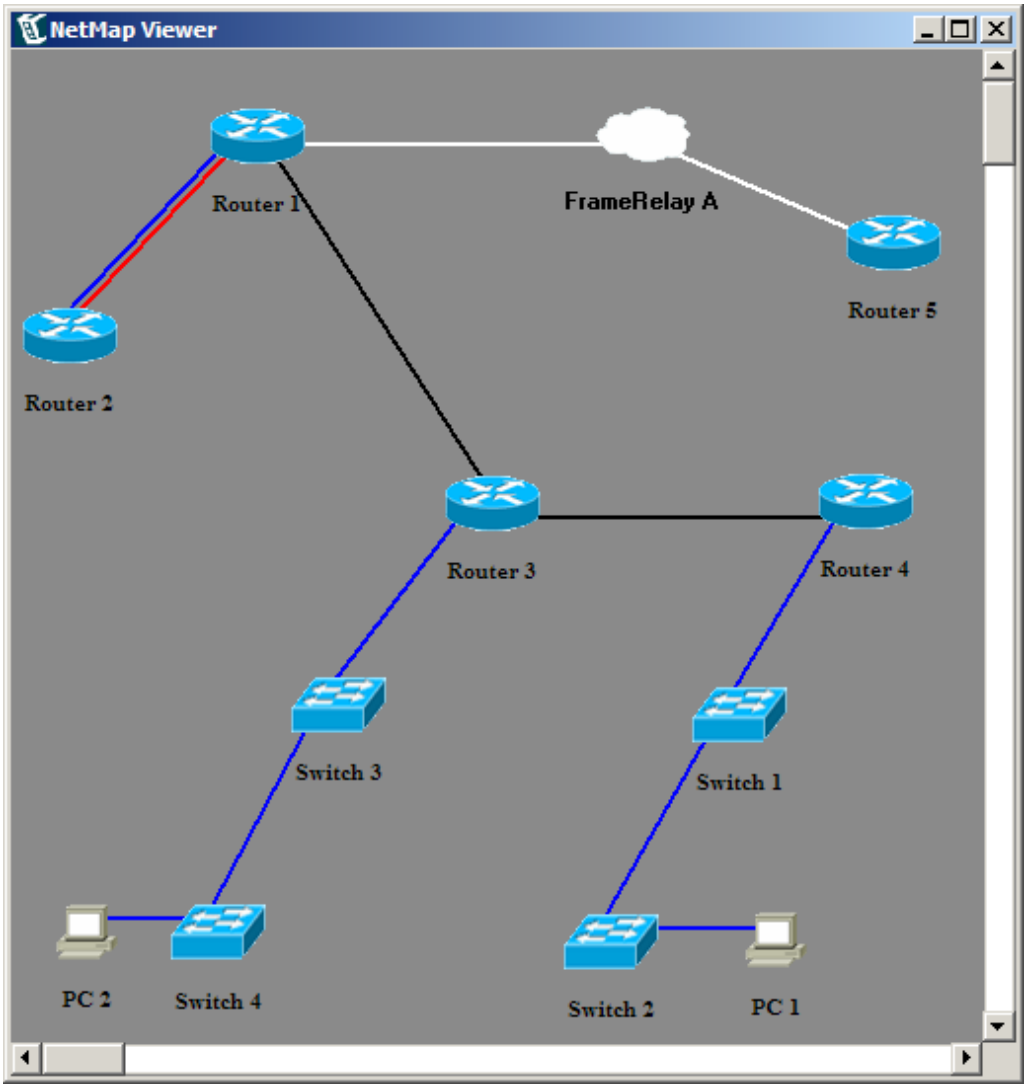
From within the Boson NetSim, select the **Advanced Mode (Telnet)** option under the **Modes** menu.



After the Control Panel (horizontal toolbar) appears, simply click the **NetMap** button to review the currently loaded default network topology.



This will launch the NetMap Viewer application as a separate process, so you can use the ALT+TAB key combination to switch between your network diagram and the other Boson NetSim components. The default NetMap is shown below:



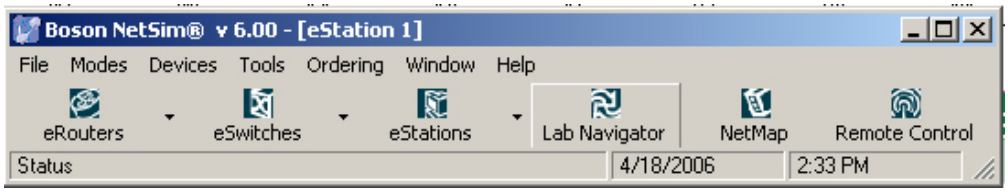
The NetMap Viewer showing your current network diagram

Color legend, as defined in the Boson Network Designer:

1. Blue is Ethernet
2. Red is ISDN/Dialup or PRI
3. **Black** is Serial PPP
4. White is Serial Frame

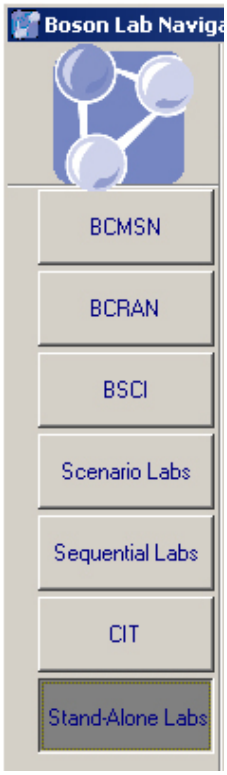
Step 3: Lab Navigator Utility

To start a lab or lesson, click the Lab Navigator button on the top horizontal toolbar (as shown below), or select it from the Window menu. This launches the Cisco CCNA Lab Navigator application as a separate process, so you can use the ALT+TAB key combination to move between the labs and multiple Telnet windows.



The easy way to load the Lab Navigator utility

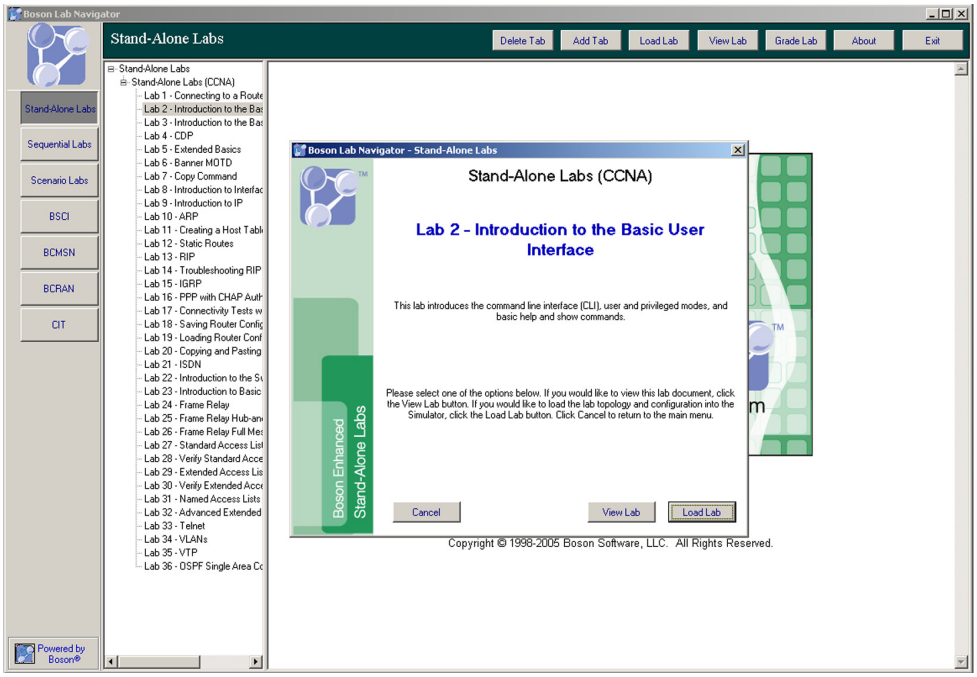
Within the Lab Navigator, you can access the included labs by selecting one of the tabs shown on the left and choosing a lab from the list that appears.



Tips:
The labs are organized into sections to match the Lab Navigator content bar, as shown to the left.

For the purpose of this lab walkthrough, please select the Stand-Alone Labs tab, which will show all of the labs in that category.

Next, select **Lab 2 - Introduction to the Basic User Interface**. This lab will be used for this tutorial.


Boson Lab Navigator
Stand-Alone Labs
Delete Tab
Add Tab
Load Lab
View Lab
Grade Lab
About
Exit
Stand-Alone Labs
Sequential Labs
Scenario Labs
BSCI
BCMSN
BCRAN
CIT
Powered by Boson®
Boson Lab Navigator - Stand-Alone Labs
Stand-Alone Labs (CCNA)
Lab 2 - Introduction to the Basic User Interface
This lab introduces the command line interface (CLI), user and privileged modes, and basic help and show commands.
Please select one of the options below. If you would like to view this lab document, click the View Lab button. If you would like to load the lab topology and configuration into the Simulator, click the Load Lab button. Click Cancel to return to the main menu.
Boson Enhanced Stand-Alone Labs
Cancel
View Lab
Load Lab
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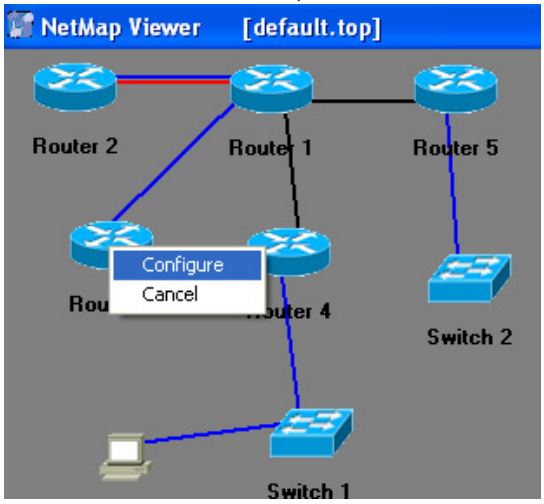
Lab 2 from the Stand-Alone Labs

Step 4: Different Methods for Telnet in Advanced Mode

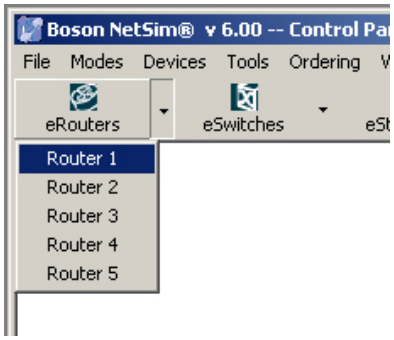
There are a total of four methods for launching your default Telnet program and automatically connecting to the selected device. Pick one to continue with the tutorial, or try experimenting with all four methods. The first step of this lesson's lab is simply to use Telnet to connect to Router 1.

Telnet Method 1 of 4: Directly from within the NetMap Viewer, right-click Router 3 (or any device), and select **Configure**. (Note that if you double-click the device instead of right-clicking, a **Device Statistics** window will appear instead of a Telnet window.)



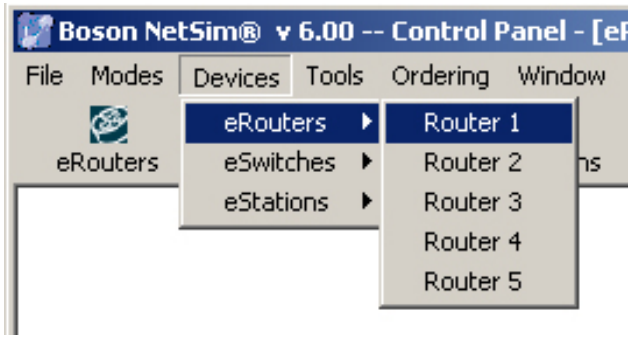
*The moment you select **Configure**, your default Telnet application will connect to the selected Router 3.*

Telnet Method 2 of 4: Left-click the **Routers** button on the Control Panel (top horizontal toolbar) to receive a list of devices currently configured within the existing NetMap Topology.



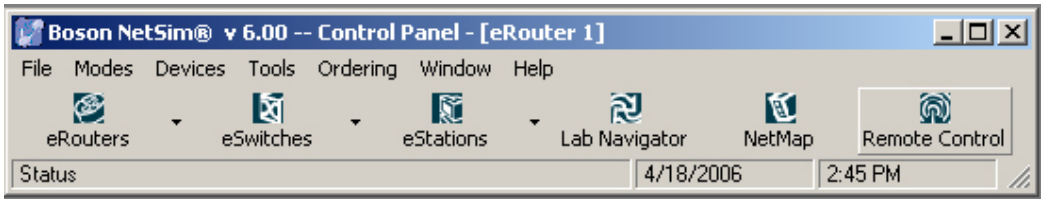
*The moment you select **Router 3**, your default Telnet application will connect to the selected Router 3.*

Telnet Method 3 of 4: Click the **Devices** Control Panel menu, expand **eRouters** by holding the mouse pointer over it, and select **Router 3**.

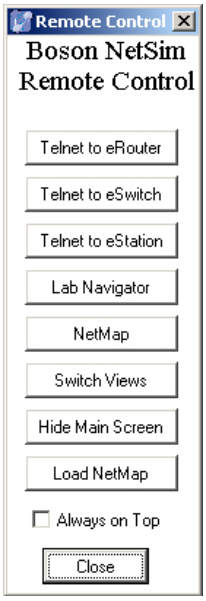


*The moment you select **Router 3**, your default Telnet application will connect to the selected Router 3.*

Telnet Method 4 of 4: If you have closed the Remote Control vertical toolbar, please re-launch the toolbar by clicking the **Remote Control** button within the Control Panel horizontal toolbar:



From the Remote Control vertical toolbar, click the **Telnet to eRouter** button to receive a list of routers currently configured within the existing NetMap Topology. Select **Router 3** from the pop-up menu. The moment you select **Router 3**, your default Telnet application will connect to Router 3.

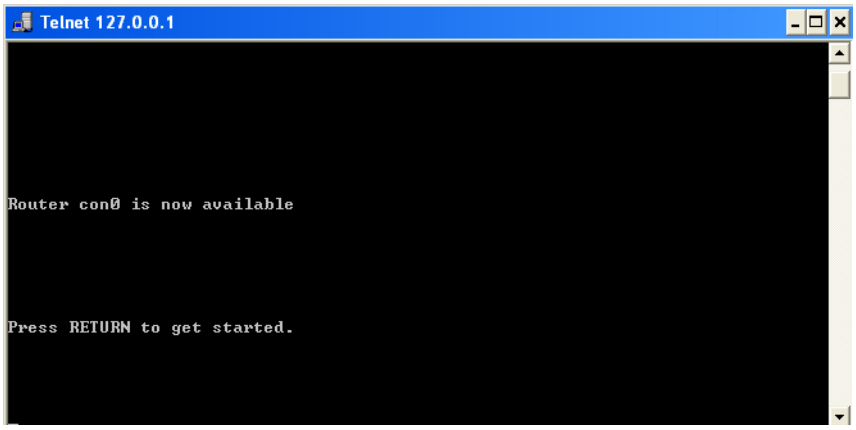


Boson Remote Control

Step 5: Configuring Router 1 with Telnet

Assuming you are using the default telnet.exe program provided by the Windows operating system, you should see a Telnet window with the default Cisco router prompt of **Router>** for Router 3. With what you have just learned, select Router 1.

Carry out the instructions in Lab 2. When you have completed step 8, which is the last step in this particular lab, you should be shown how to log off the router. When you type **exit**, you will effectively log off the router; however, Telnet will still be open.

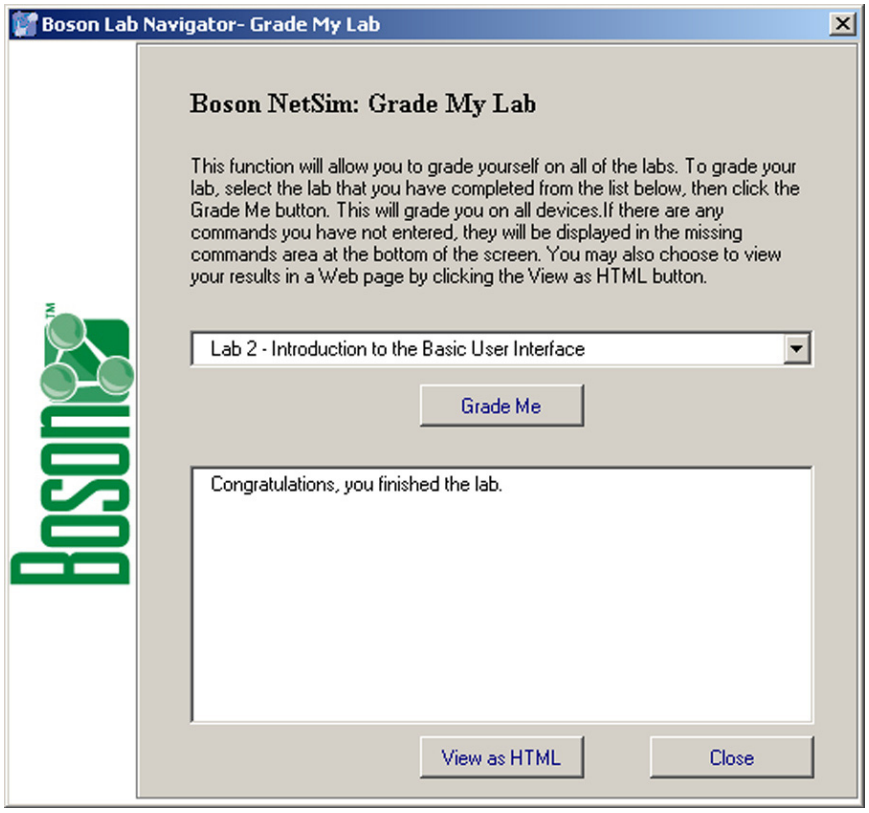


Telnet window attached to Router 1 showing the result at the end of Lab 2

Do not close telnet.exe yet. Grade your lab with the Boson NetSim Lab Grader tool first.

Step 6: Self-Grade Your Lab

From within the Lab Navigator, select the **Grade Lab** button at the top of the screen. Once you left-click the **Grade Lab** button, the self-grading utility will launch and will default to the last lab that you loaded from the drop-down list. See the following exhibit.


Boson Lab Navigator- Grade My Lab
Boson NetSim: Grade My Lab
This function will allow you to grade yourself on all of the labs. To grade your lab, select the lab that you have completed from the list below, then click the Grade Me button. This will grade you on all devices.If there are any commands you have not entered, they will be displayed in the missing commands area at the bottom of the screen. You may also choose to view your results in a Web page by clicking the View as HTML button.
Lab 2 - Introduction to the Basic User Interface
Grade Me
Congratulations, you finished the lab.
View as HTML
Close

Selecting Lab 2 to grade

It is important to note that the self-grade utility must be expecting the included lab configuration in order to function properly. This means that if you are following labs that are not included within the Boson NetSim labs, then this feature must first be configured to expect the correct lab input.

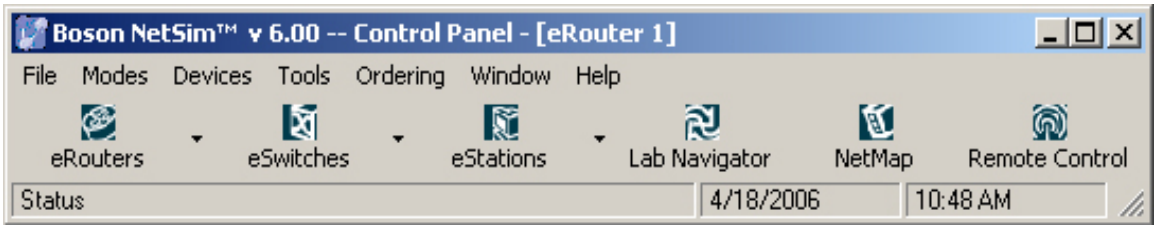
From within the **Grade My Lab** screen, use the drop-down list to select Lab 2, and then click the **Grade Me** button. If any device configuration has an error, you will be notified in the box below the **Grade Me** button.

You may now close your Telnet program; to do so in the normal Windows fashion, click the **X** button (the standard close-window button) in the upper-right corner of the window.

Feature Overview

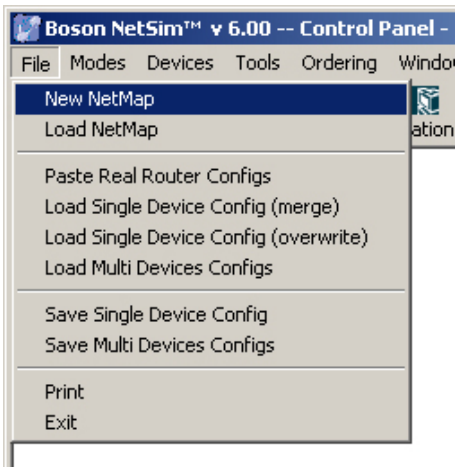
Control Panel (Main Menus)

The main menus are located on the top of the Control Panel (horizontal toolbar) page and are accessed one of two ways. The first way is to move the mouse cursor over the appropriate menu and click the menu to display the menu options. When you find the option you would like to choose, click it.



You can also press the ALT key located next to the SPACEBAR and push the DOWN ARROW to display the contents of the menu bar. Alternatively, you can simply press ALT+ the underlined letter in the menu item (i.e., ALT+F brings up the **File** menu). You can then use the arrow keys on the keyboard to display the rest of the menu bar. When you find the option you would like to choose, highlight it and press the ENTER key.

File Menu



New NetMap

This option opens the Boson Network Designer, which allows you to design a new network topology (NetMap). The topology (*.top) file must be saved within the Network Designer for use with the Simulator.

Load NetMap

This option loads the saved Network Designer file (NetMap topology in *.top format) into the Boson NetSim, which allows you to configure the devices.

Paste Real Router Configs

This tool allows you to paste the running configuration from a real router into the NetSim. Selecting this menu option will open a small window into which you can paste the desired configuration. The configuration will be loaded into the active router in the NetSim interface.

Load Single Device Config (Merge)

This option keeps your current device configuration and loads a device configuration stored in a previously saved configuration file (*.rtr). This option does NOT allow you to load a new Network Designer (*.top) file into the Boson NetSim. To do that, select the **Load NetMap** option under the **File** menu.

Load Single Device Config (Overwrite)

This option erases your current device configuration and then loads a device configuration from a saved file (*.rtr). This option does NOT allow you to load a new Network Designer (*.top) file into the Boson NetSim. To do that, select the **Load NetMap** option from the **File** menu.

Load Multi Devices Configs

This tool reloads the last saved "snapshot" of every single device configuration that was previously saved using the **Save Multi Devices Configs** option.

Save Single Device Config

This option saves an individual device configuration to load with a real device or with the Boson NetSim at a later time. **Note:** All files are saved in the *.rtr format.

Save Multi Devices Configs

This option takes a "snapshot" of every single device that is currently loaded in the Boson NetSim and allows you to save ALL of your device configurations to disk at once. In effect, this is like making a TFTP configuration backup of all devices (routers, switches, and stations) on your entire network with the click of a button. **Note:** This will save one *.rtr file, for each device currently loaded in the Boson NetSim. This will also save a single *.nwc (network configuration) file, which will be used to link the *.rtr files together.

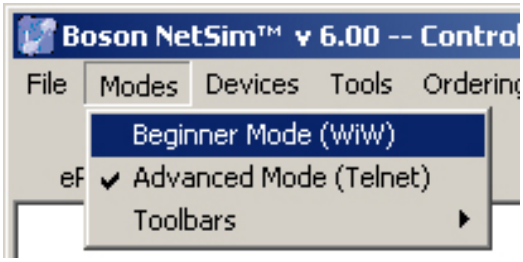
Print

This option prints a screenshot of the current workspace.

Exit

This option closes the program.

Modes Menu



Beginner Mode (Window-in-Window)

The Window-in-Window interface opens the main window and displays the Router 1 interface. From this screen, you can access all of the additional features of the Boson NetSim or continue to work with Router 1. Switching between the different devices is as easy as clicking the button of the device you would like to configure. You can also use the F# keys on your keyboard to switch between devices. F1 is for Device 1, F2 is for Device 2, and so on.

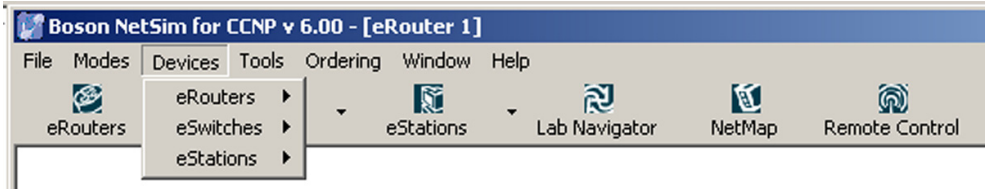
Advanced Mode (Telnet)

The Telnet interface hides the main window and also brings up the Remote Control. The Telnet interface gives you the option to launch routers, switches, and stations, as well as the Lab Navigator and NetMap. This mode brings up a different Telnet window for each device you would like to configure. When you are finished configuring each device, simply close the Telnet window. The Simulator also has a built-in method of switching between devices inside one Telnet window. When you are ready to connect to a different device, you can also use the CTRL+Q key combination to bring up a menu listing of all devices available through the Virtual Terminal Server. See the "Virtual Terminal Server" section of this manual for more details.

Toolbars->Remote Control

The Remote Control is a new addition to the Boson NetSim and is designed to allow for easy navigation through the program. The Remote Control includes buttons to quickly launch devices and access features such as the Lab Navigator and the NetMap tools. You can also switch views or hide the main screen. The Remote Control is the easiest way to interface with all of the NetSim features.

Devices Menu



This menu permits fast and easy access to the various simulated device command prompts in the simulated network.

eRouters

The emulated routers used in the Boson NetSim are designed to imitate real routers by simulating commands, routing tables, protocols, and interfaces.

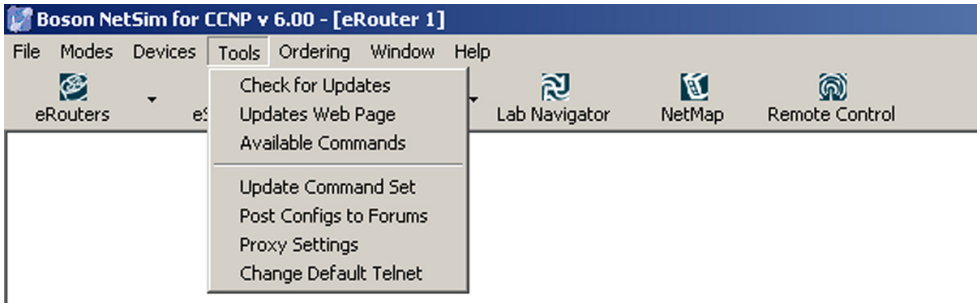
eSwitches

The emulated switches used in the Boson NetSim are designed to imitate real switches by simulating commands, bridge tables, protocols, and interfaces.

eStations

The emulated stations are simulated personal computers running the Boson Operating System Simulator (BOSS) command-line interface. The stations consist of PCs with one Ethernet connection. When you telnet to a station, the BOSS command window will open. Type **?** to display a list of available BOSS commands, or type **help** to display an overview.

Tools Menu



Check For Updates

This option loads a program that automatically checks Boson's update server and determines whether product updates are available. If updates are available for any of the NetSim components, the program lists the updates separately and gives you the option to easily download and install them. As with any software product, you should routinely check for product updates, feature enhancements, and bug fixes that may not have been available at the time you received the product. Updates can be obtained free of charge for a period of 90 days from the date of registration and activation.

Updates Web Page

If you do not have Internet access on the computer from which you wish to check for updates, or if your computer is behind a firewall that restricts the update utility, then you can also use the traditional manual update method of downloading a product update file for later installation. Update files can be manually downloaded for a period of 90 days from the date of registration and activation from the following Web site: http://www.boson.com/CCNS.html.

Available Commands

Clicking this option opens a new window that gives you the choice to display the currently available commands for the routers and switches. You can choose to view commands according to the mode in which they are available, including the user EXEC, privileged EXEC, configuration, and interface modes. Alternatively, you can simultaneously view the commands available for all modes.

Update Command Set

This option downloads the latest commands available in NetSim from the www.boson.com Web site. In order to complete this process, you will need to enter your boson.com account information. If you do not remember your account information, please visit www.boson.com/account.

Post Configs to Forums

Use this option to send a ZIP file with all of your configurations to the Boson support staff. Be sure to include the .top, .nwc, and .rtr files along with a description of the problem you are encountering. A Boson representative will respond as soon as possible.

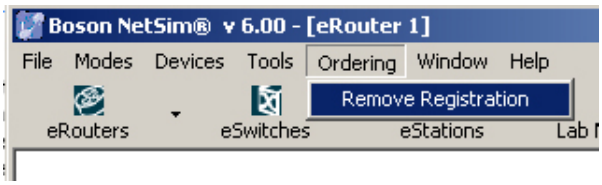
Proxy Settings

If your computer is behind a proxy server, enter your proxy settings into this form in order to access the Internet for product registration and to download the latest product features.

Change Default Telnet

This feature allows individuals and companies to set up their Telnet application to default to their favorite Telnet program. It even supports passing custom command-line settings to the EXE.

Ordering Menu



Remove Registration

You should never use this special option unless instructed to do so by Boson technical support. This option permanently removes your Unique Serial Number (license key) from your computer and generates a unique removal code. You should keep a copy of the removal code and your correspondence with Boson's technical support for your own records.

CAUTION: This function is used to remove the license from your computer. Selecting this option will open a new window to remove the registered version of the Boson NetSim from your computer. To complete the process of removing the Boson NetSim license key from your computer, type **99** in the text box, and click **OK**. If you do not want to complete this operation, click **Cancel**.

Window Menu

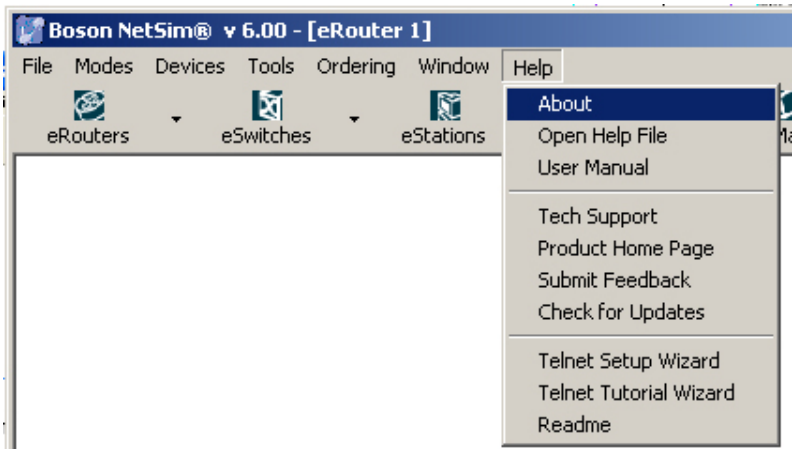
Lab Navigator

The Lab Navigator is designed to supply an easy way for the user to see all the labs and lessons available in the Boson NetSim. The Lab Navigator also provides users with a simple way to select the labs they would like to complete by simply clicking the lab names. The arrow keys can also be used to maneuver through the menu, and the ENTER key can be used to select the desired lab or lesson.

Remote Control

The Remote Control toolbar is designed for easy navigation of the Boson NetSim features. The Remote Control toolbar includes **Telnet to Router**, **Telnet to Switch**, **Telnet to Station**, **Lab Navigator**, and **NetMap** buttons. The Remote Control can also be used to switch views or hide the main screen.

Help Menu



About

Clicking **About** displays basic information about the Boson NetSim version and company information. In the **About** screen, you can click the **System Info** button in order to view information about your computer.

Open Help File

The Help file contains information and tutorials for both the Simulator and the Network Designer.

User Guide
The User Guide is the product manual, which is designed to help the Boson NetSim user understand the features and operations of the program. The User Guide is the document you are reading now.

Tech Support
Clicking **Tech Support** displays the Boson contact information.

Product Home Page
Selecting this option will load the Boson Web site http://www.boson.com/CCNS.html, from which you can download the latest NetSim revisions, check for updates, research the latest FAQs, and so on.

Submit Feedback
Selecting this option will launch a Web browser to boson.com's feedback page. If you have feature requests or product suggestions, please enter them here. This service does not offer technical support, although Boson highly respects and values any and all feature requests or other suggestions for product enhancement.

Check for Updates
This option performs the same actions as the **Check for Updates** option under the **Tools** menu. It loads a program that automatically checks Boson's update server and determines whether product updates are available. If updates are available for any of the NetSim components, the program lists the updates separately and gives you the option to easily download and install them. As with any software product, you should routinely check for product updates, feature enhancements, and bug fixes that may not have been available at the time you received the product. Updates can be obtained free of charge for a period of 90 days from the date of registration and activation.

Telnet Setup Wizard
This wizard tests and configures your default Telnet application for use with the Boson NetSim.

Telnet Tutorial Wizard
This tutorial wizard is fully scripted and automated to walk you through many of the common steps necessary for working in the Boson NetSim with Telnet.

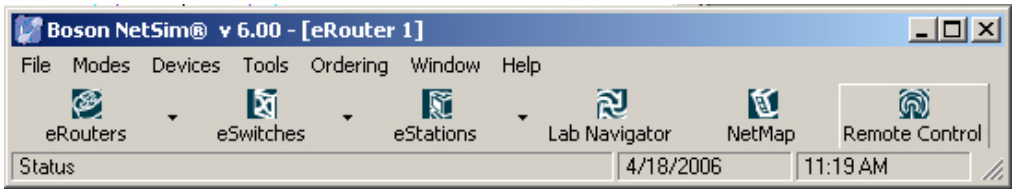
It will automatically guide you through the basic steps required for the following:

1. Basic operation of the Boson NetSim
2. Building your own simulated network
3. Performing a simple practice lab

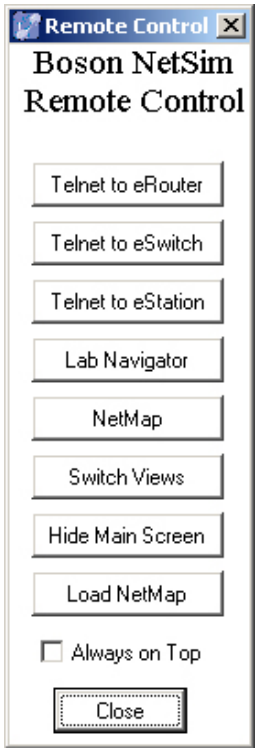
Readme
This file lists any last-second errata, the required computer components, the minimum and recommended PC requirements, and the basics of getting started. This information is provided in addition to the User Guide.

Control Panel (Advanced)

Remote Control Toolbar



Clicking the **Remote Control** button from the Control Panel toolbar causes the following vertical toolbar to appear:



Clicking any of the top three **Telnet to…** buttons displays a side-bar selector that allows the user to select from a list of all active devices of that type.

Clicking the **Lab Navigator** button launches the Boson NetSim lab menu system, permitting the selection of numerous included labs.

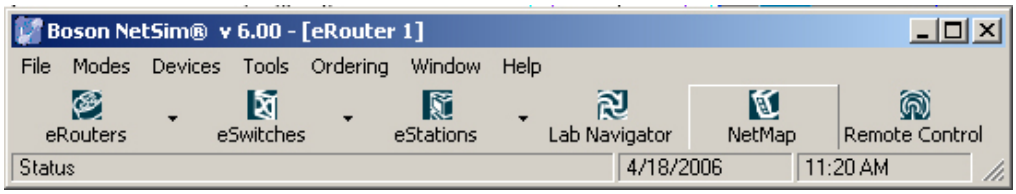
Clicking the **NetMap** button shows the network topology diagram of all devices currently loaded.

Clicking the **Switch Views** button toggles between the Window-in-Window (WiW) interface and the industry-standard Telnet interface.

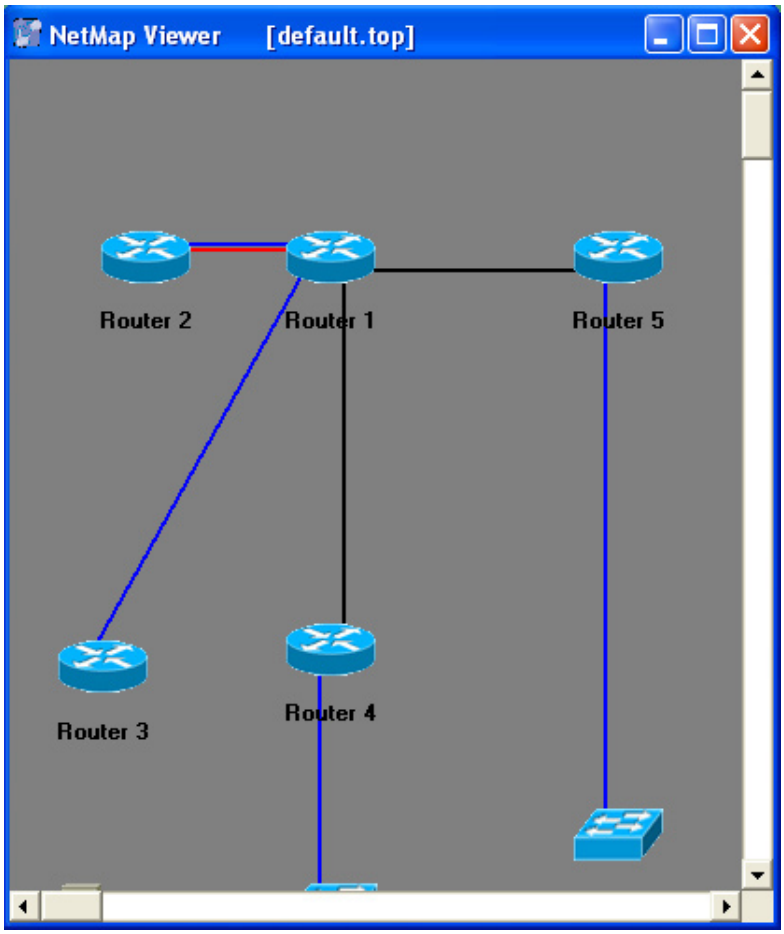
Clicking the **Hide Main Screen** button has a different effect depending upon the current mode (WiW or Telnet). If NetSim is in WiW mode, all devices will be hidden. If NetSim is in Telnet mode, the Control Panel will be hidden.

Clicking the **Load NetMap** button opens a dialog box that allows you to choose the network topology you would like to load into the Simulator.

NetMap (Topology Viewer)



The **NetMap** button loads the currently active topology file into the Network Designer in read-only mode, as further described below:



The NetMap Viewer displays a snapshot of all devices currently loaded.

There are two ways to access this topology screen:

1.) Click the **NetMap** button on the Control Panel horizontal toolbar.

2.) Click the **NetMap** button on the Remote Control vertical toolbar.

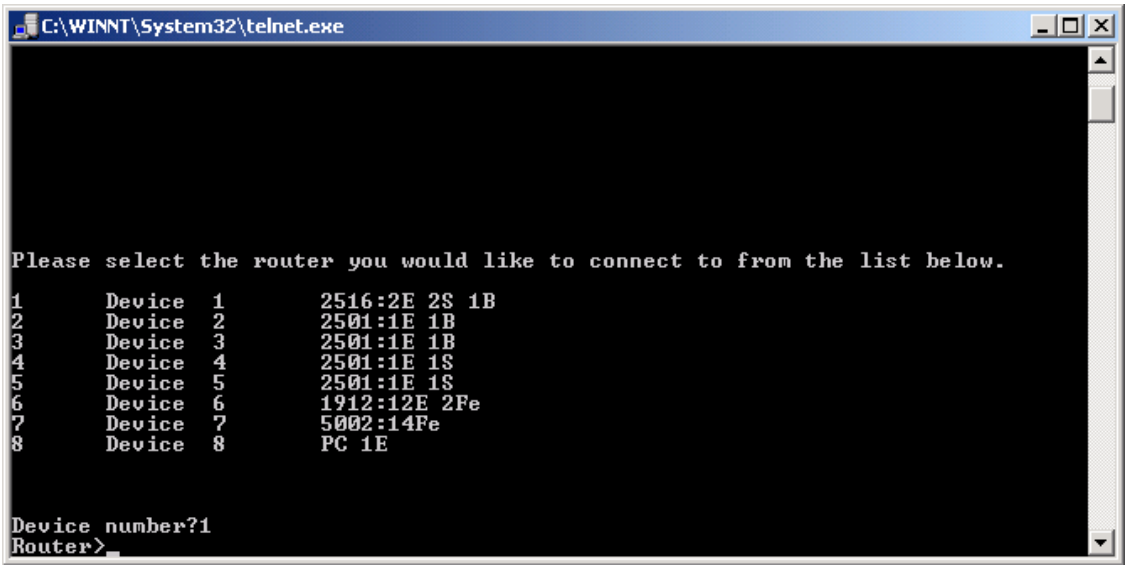
Note: You can right-click any device shown in the NetMap Viewer to access a **Configure** menu option.

Virtual Terminal Server

The Virtual Terminal Server permits you to virtually attach to simulated devices and cycle between them without the need for separate Telnet sessions.

During any Telnet session to any device (router, switch, or station), you can access the Virtual Terminal Server by using the CTRL+Q key combination.

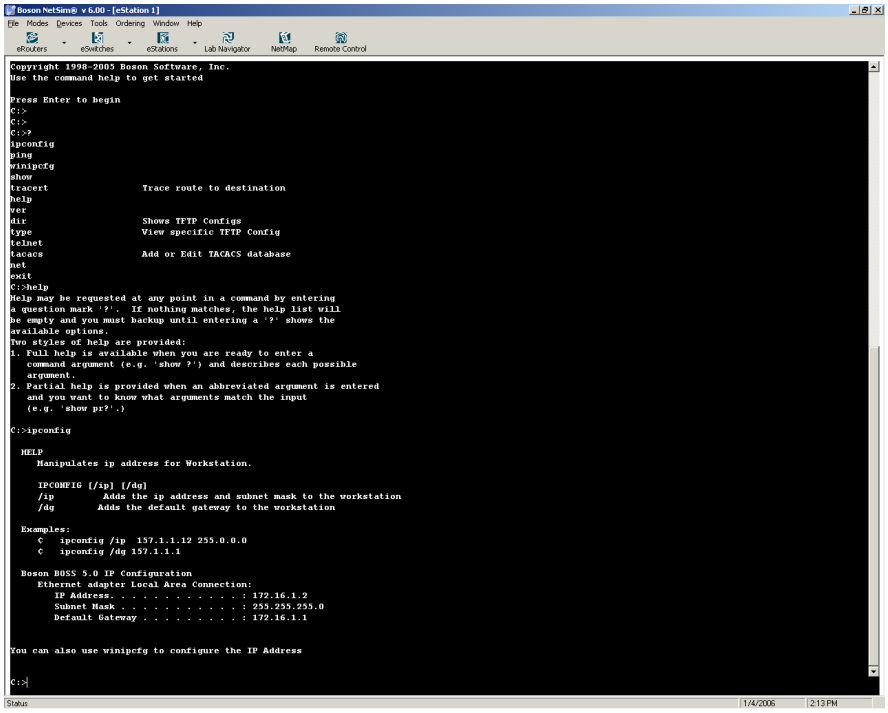
The example below shows Device 1 forming a session:


C:\WINNT\System32\telnet.exe
Please select the router you would like to connect to from the list below.
1 Device 1 2516:2E 2S 1B
2 Device 2 2501:1E 1B
3 Device 3 2501:1E 1B
4 Device 4 2501:1E 1S
5 Device 5 2501:1E 1S
6 Device 6 1912:12E 2Fe
7 Device 7 5002:14Fe
8 Device 8 PC 1E
Device number?1
Router>

The Virtual Terminal Server

Simulated Workstations

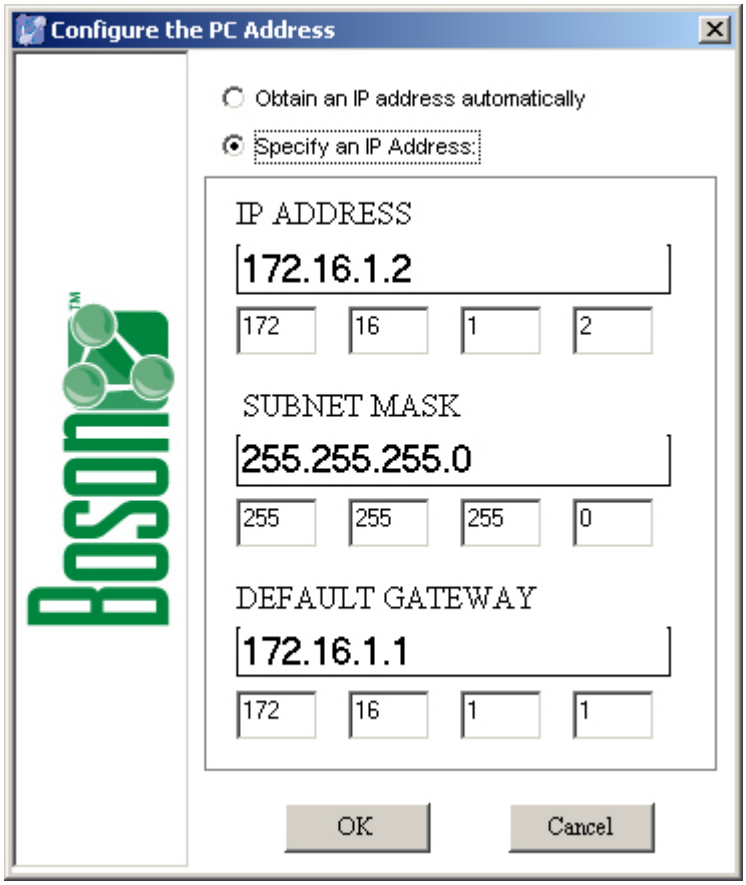
When you telnet to the station, the Boson Operating System Simulator (BOSS) command window will open. Type **?** to display a list of available BOSS commands, or type **help** to display an overview.


Boson NetSim® v 6.00 - [eStation 1]
File Modes Devices Tools Ordering Window Help
eRouters eSwitches eStations Lab Navigator NetMap Remote Control
Copyright 1998-2005 Boson Software, Inc.
Use the command help to get started
Press Enter to begin
C:>
C:>
C:>?
ipconfig
ping
winipcfg
show
tracert Trace route to destination
help
ver
dir Shows TFTP Configs
type View specific TFTP Config
telnet
tacacs Add or Edit TACACS database
net
exit
C:>help
Help may be requested at any point in a command by entering
a question mark '?'. If nothing matches, the help list will
be empty and you must backup until entering a '?' shows the
available options.
Two styles of help are provided:
1. Full help is available when you are ready to enter a
command argument (e.g. 'show ?') and describes each possible
argument.
2. Partial help is provided when an abbreviated argument is entered
and you want to know what arguments match the input
(e.g. 'show pr?'.)
C:>ipconfig
HELP
Manipulates ip address for Workstation.
IPCONFIG [/ip] [/dg]
/ip Adds the ip address and subnet mask to the workstation
/dg Adds the default gateway to the workstation
Examples:
C ipconfig /ip 157.1.1.12 255.0.0.0
C ipconfig /dg 157.1.1.1
Boson BOSS 5.0 IP Configuration
Ethernet adapter Local Area Connection:
IP Address. . . . . : 172.16.1.2
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 172.16.1.1
You can also use winipcfg to configure the IP Address
C:>
Status
1/4/2006
2:13 PM

Simulated workstation interface

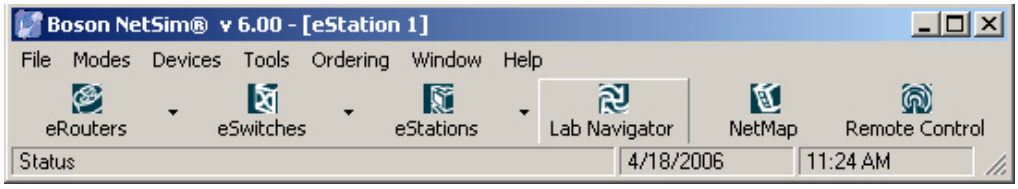
Changing TCP/IP Settings on the BOSS Station

Unlike actual operating systems, the BOSS station permits you to directly modify its TCP/IP settings within the **winipcfg** utility, which is launched from the command line and is shown below:



winipcfg

Lab Navigator



Overview

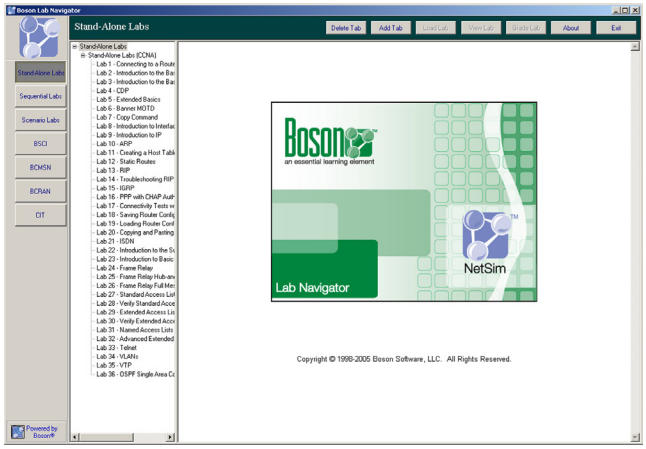
The Lab Navigator is a one-stop source for all your CCNA- and/or CCNP-level labs. A grading option is available after you have completed a lab. Each lab is highly accessible, being only a few mouse clicks away. Study at your own pace and study well knowing that these labs have been individually tested by a CCIE® test panel.

Getting Started

The Lab Navigator starts automatically when you launch the Boson NetSim. If for some reason you have closed the package, just locate the **Lab Navigator** button on the toolbar in the Simulator. To launch the Network Simulator, locate the shortcut on either your desktop or within your **Start** menu.

When the Lab Navigator is launched, you will see that the interface is well organized. The topics from which you can locate your labs are laid out in a tab format. The dark gray tab indicates the currently selected lab category.

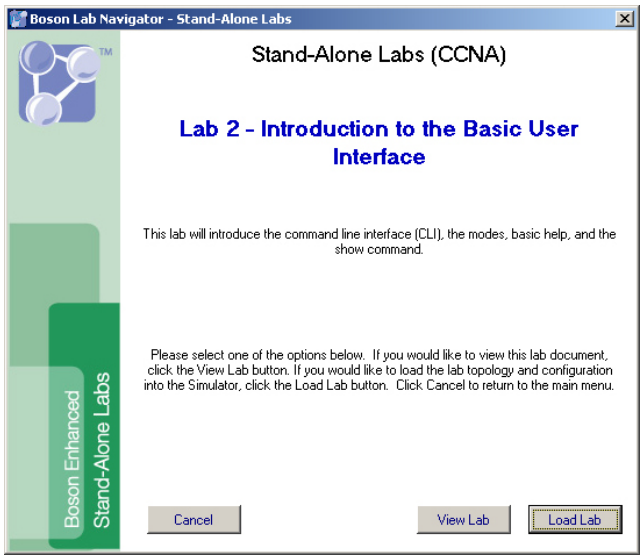
To the right of the tabs is the current list of labs for the topic that you have selected. To select a lab, double-click one of the individual labs. A new window will appear.



You will need a PDF viewer, such as Adobe Acrobat Reader (found at http://www.adobe.com), in order to view the instructions for these labs. You can display the lab instructions by clicking the **View Lab** button.

This introductory screen displays the topic and a brief overview of the lab, along with any special instructions you may need to follow before loading the lab. You have the option of viewing the lab instructions, loading the lab, or canceling.

View the lab instructions PDF by clicking the **View Lab** button, and then load the lab into the Network Simulator by clicking the **Load Lab** button.


Boson Lab Navigator - Stand-Alone Labs
Stand-Alone Labs (CCNA)
Lab 2 - Introduction to the Basic User Interface
This lab will introduce the command line interface (CLI), the modes, basic help, and the show command.
Please select one of the options below. If you would like to view this lab document, click the View Lab button. If you would like to load the lab topology and configuration into the Simulator, click the Load Lab button. Click Cancel to return to the main menu.
Boson Enhanced
Stand-Alone Labs
Cancel
View Lab
Load Lab

Lab Topics

To print the lab instructions at any time, simply select the **Print** option within the lab PDF. The labs in the Boson NetSim are divided into six categories. They are as follows:

1. Stand-Alone Labs (CCNA and CCNP versions of NetSim)
2. Sequential Labs (CCNA and CCNP versions of NetSim)
3. Scenario Labs (CCNA and CCNP versions of NetSim)
4. BSCI (CCNP version of NetSim)
5. BCRAN (CCNP version of NetSim)
6. BCMSN (CCNP version of NetSim)
7. CIT (CCNP version of NetSim)

Stand-Alone Labs

You can complete the Stand-Alone Labs in any order you choose because most are independent of each other. They are designed to cover the various CCNA topics at an easy pace. They can also serve as refresher labs. Because the topology varies between most of the labs, you will not become bored. Each lab includes step-by-step instructions and study notes.

Sequential Labs

As the name implies, these labs should be completed in order because each one builds on the skills mastered in the previous one. These labs are designed to assist you in understanding how all of the covered technologies interoperate to provide an efficient networking experience. If you want to close the Simulator before you complete all of the Sequential labs, you should first save your configuration. If you do not save the configuration, you may have to repeat numerous steps when you resume.

Scenario Labs

In these labs, you will be given the opportunity to read a scenario and work on your own to complete the lab. Besides the scenario, you are provided with a simple running configuration list illustrating the major points that

you should address in order to correctly complete the lab. These labs are designed to require you to practice your skills.

BSCI Labs (CCNP Only)

BSCI is notoriously the most difficult of the four CCNP exams. These labs challenge you to build on the skills you learned while pursuing your CCNA by expanding your knowledge of the CCNP curriculum. Setting up a BGP network and routing multi-area OSPF are just some of the tasks these labs cover.

BCRAN Labs (CCNP Only)

These labs test your skills on technologies such as NAT, IPSEC, ISDN, Frame Relay, LLQ, AAA, and backup interfaces to give you the experience you need with the technologies covered in this exam.

BCMSN Labs (CCNP Only)

Get your hands on the Cisco Catalyst 3550 switch as you tackle labs covering VLANs, VTP, Spanning Tree, PortFast, QoS, TACACS, and Layer 3 switching.

CIT Labs (CCNP Only)

After you have learned the technologies that comprise the first three CCNP labs, these labs will test your skill at troubleshooting a network that is not working properly. You will be presented with a "broken" network and guided through the steps necessary to fix the problem.

Grade Lab

The Boson NetSim includes a Lab Grader. When you think you have completed a lab successfully, select the **Grade Lab** button at the top of the Lab Navigator screen. The **Grade Lab** button is not available until you open a lab. The Lab Grader automatically selects the lab that you most recently loaded or selected in the Lab Navigator. What if you want to grade a different lab? You can choose a different lab from the drop-down list on the **Grade My Lab** page. If the **Grade My Lab** feature tells you "Congratulations, you have finished the lab", then you have successfully completed the lab. If you have not correctly completed the configurations in the lab, then you will be alerted to the missing requirements. You can also use the Lab Compiler to add your own custom labs to the Lab Grader. A detailed explanation of the Lab Compiler is included in Appendix E.

Network Designer

The included full version of the Network Designer is a tool you can use to create your own custom networks. Using this tool, you can build either a simple or complex network; you can even model an existing network. Note that the Network Designer is not required to complete the included labs because they are pre-created and require no additional configuration. The Network Designer is provided solely to allow you to practice creating and administering your own Cisco networks.

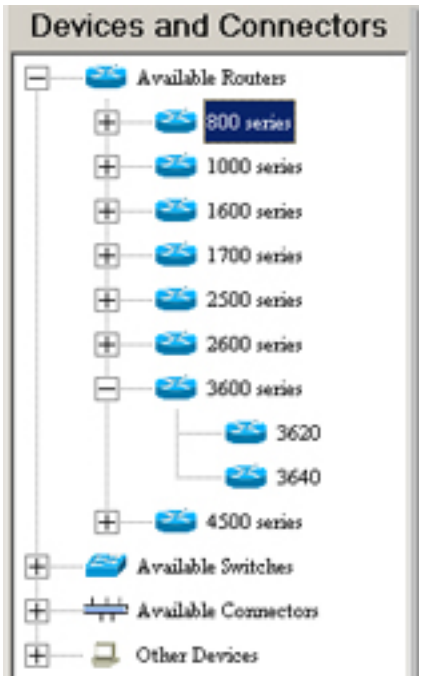
The two primary concepts involved are as follows:

1. Network Designer NetMap topology files (*.top format) contain the physical layout of networks as seen in the NetMap Viewer. The only way to add or delete devices within a physical NetMap topology or to save and load *.top files is by using the Network Designer.
2. Topology files are unrelated to the device configurations (*.rtr format) that you will create within the Boson NetSim. The only way to configure a device once it is physically created or to save and load *.rtr files is by using the Simulator.

Using the Network Designer

To avoid confusion, it is recommended that you design and create your custom networks in the following sequence until you are familiar with the process:

1. Load the Boson NetSim, and ignore the Lab Navigator.
2. Under the **File** menu, select **New NetMap** to open the Network Designer.
3. Using the Network Designer, create your custom network (NetMap).
4. Save the Network Designer file, called a NetMap topology file.
5. Exit the Network Designer, and return to the Simulator.
6. From the **File** menu, select **Load NetMap.**
7. Point to the topology file you created in the steps above.
8. Use the Simulator to complete the device configurations.



Note: The Network Designer makes it possible to design your own custom network topologies and then configure them with the Boson NetSim.

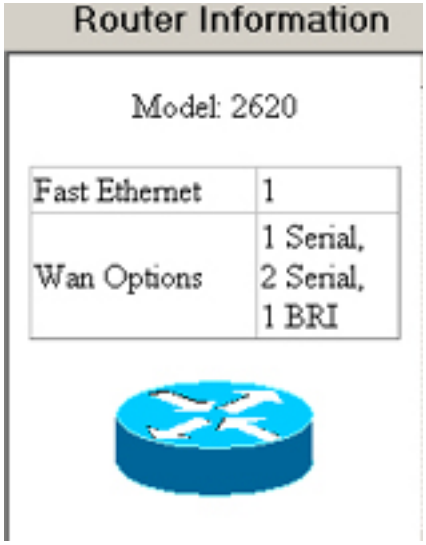
Presently, the Network Designer allows access to over 40 different router models and two different switch models, as well as access to command-line PCs.

The program supports up to 200 devices per simulated network and is licensed to be used only in conjunction with the Boson NetSim.

Device Information

When you select a device under **Devices and Connectors**, information such as device model, available ports, and slot options is displayed in the device information box, which is located in the lower-left portion of the Network Designer.

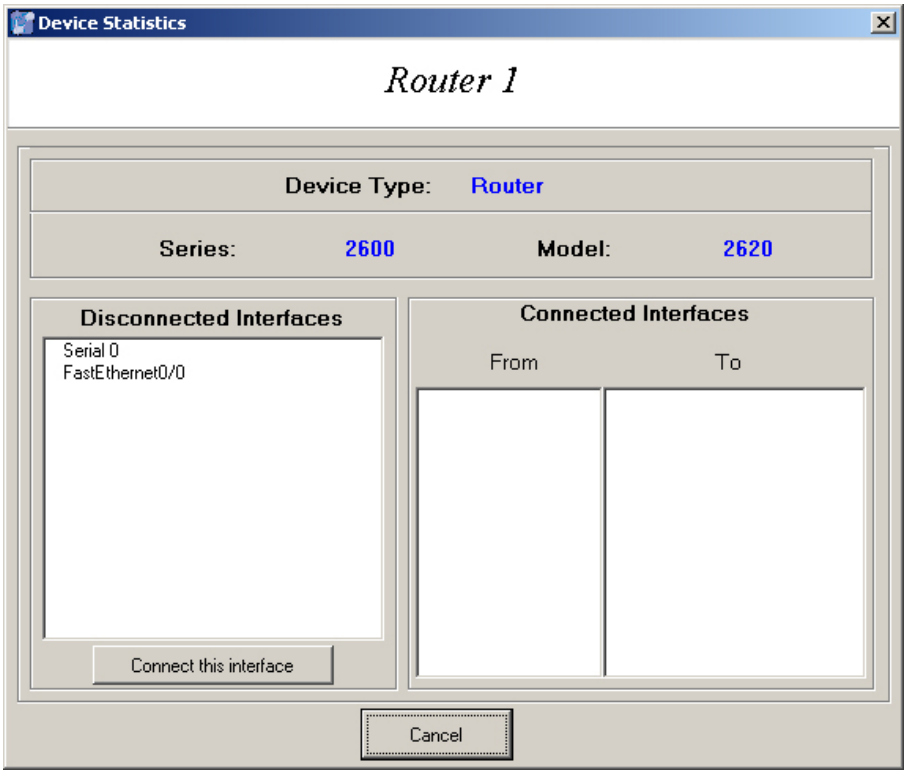
The device information box only refreshes when you click a specific device under **Devices and Connectors**. It is primarily used for showing you statistics about the device before you add it to your NetMap Topology.



The information for the selected device is presented automatically.

Display Device Statistics

To access the **Device Information and Statistics** box after you have added a device to your NetMap Topology worksheet, double-click the device in the **Disconnected Interfaces** list.



*The **Device Statistics** window*

To connect an interface, select the desired interface from the **Disconnected Interfaces** list, and then click the **Connect this interface** button. Clicking this button will close the **Device Statistics** window and will automatically take you to the correct step in the Make Connection Wizard.

Manually Adding Devices with Drag-n-Drop

An Add Device Wizard is also available.

Adding eRouters

The Network Design Topology supports eight series of routers: the 800, 1000, 1600, 1700, 2500, 2600, 3600, and 4500 series. To add a router manually to the layout area, simply follow the steps below.

1. Left-click the plus sign next to **Available Routers** to view the different router series.
2. Left-click the plus sign next to the desired router series to reveal all available models.
3. While holding the left mouse button down, drag and drop the selected router to the desired location in your NetMap Topology physical layout worksheet.

Adding eSwitches

The Network Design Topology supports two series of switches: the Catalyst 1900 and the Catalyst 2900. To add a

switch manually to the layout area, simply follow the steps below.

1. Left-click the plus sign next to **Available Switches**.
2. Left-click the plus sign next to the desired switch series to reveal all available models.
3. While holding the left mouse button down, drag and drop the selected switch to the desired location in your NetMap Topology physical layout worksheet.

Adding eStations

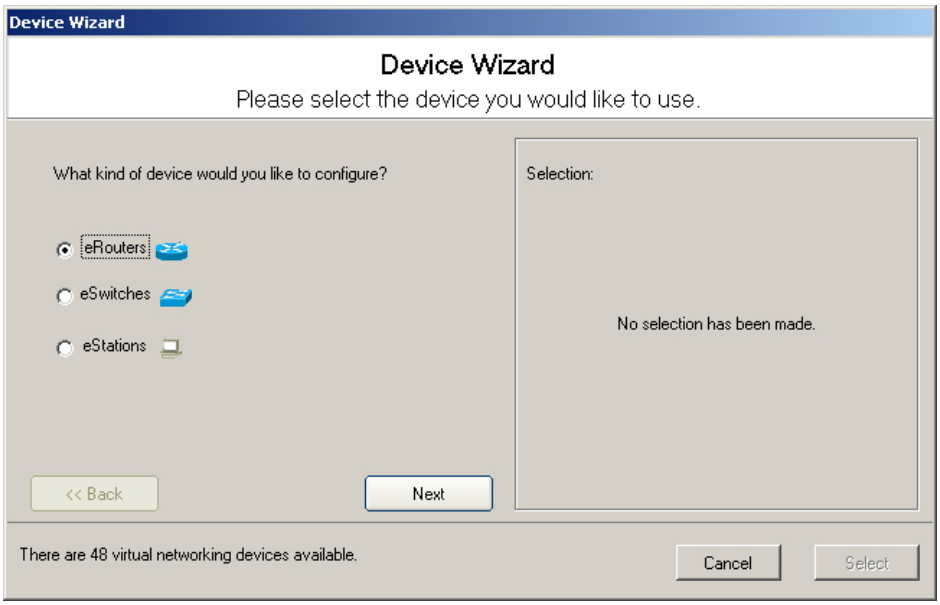
To add a PC manually to the layout area, simply follow the steps below.

1. Left-click the plus sign next to **Other Devices**.
2. Left-click the plus sign next to **pc**.
3. The available stations (PCs) will be displayed.
4. Left-click the PC you would like to add, and drag and drop it to the desired location in your NetMap Topology physical layout worksheet.

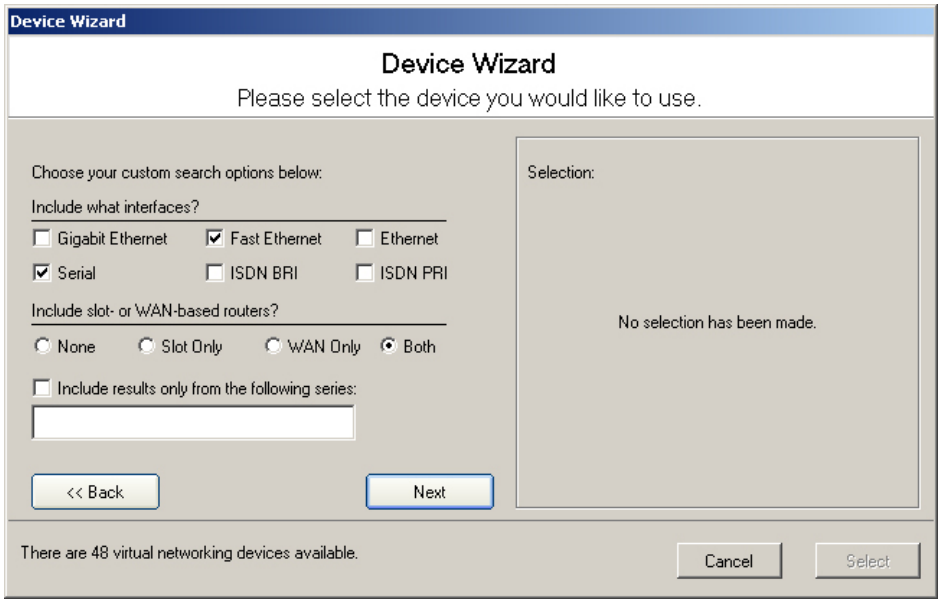
Note: A simulated PC has the same help features as a Cisco Router does. In the simulated PC box, type **?** to see a list of available commands, and type **help** to see an overview. See the section in this manual entitled "Simulated Workstations" for more information.

Using the Device Wizard

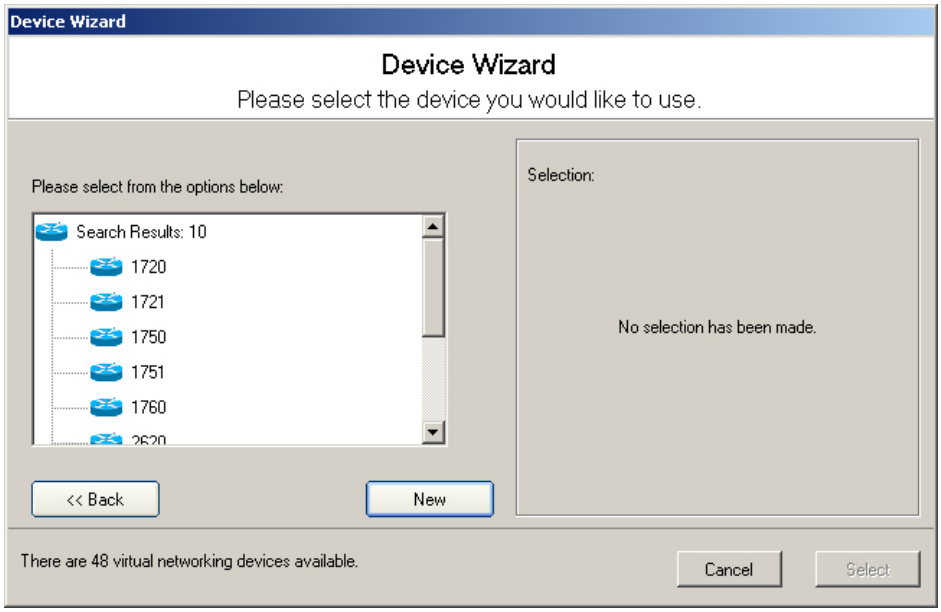
To launch the Device Wizard, simply select **Add Device Wizard** from the horizontal toolbar of the Network Designer. The Device Wizard will then guide you through the following selection and configuration process.



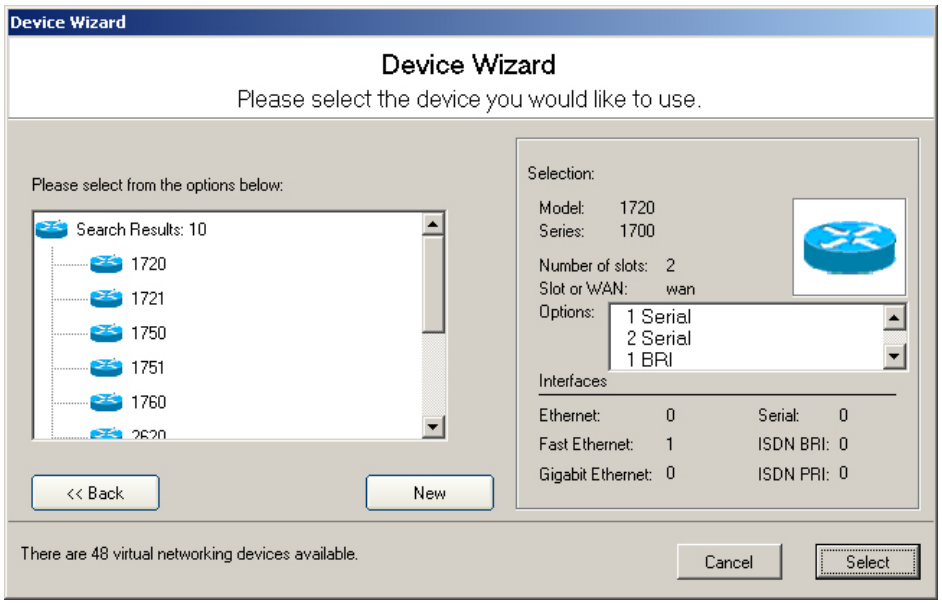
*Select the device (router, switch, or station) that you would like to add, and click **Next**.*



*Select the interfaces you want to make available on the device, and click **Next**.*



All devices that match your interface requirements are now listed. Select one of these devices.



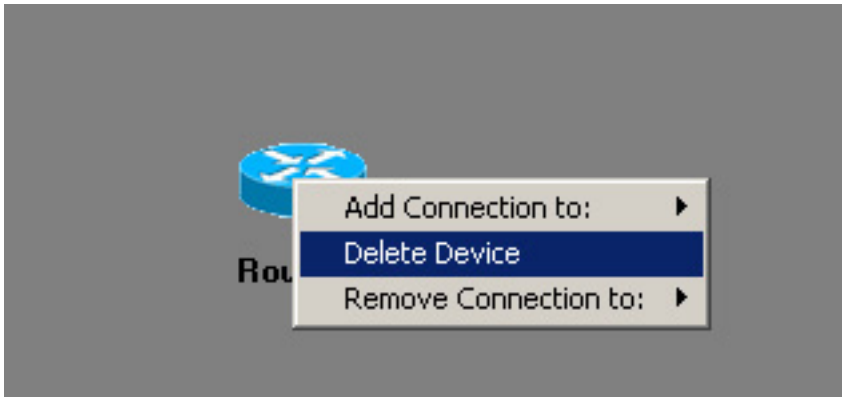
*Clicking the **Select** button at the bottom right will add this device to your NetMap window.*

Note: If you are adding a station, simply click **Select** to add the device; there are no configurable options to pick from in the Device Wizard.

Deleting a Device

From within the NetMap Topology physical layout window, perform the following actions in order to delete a device:

1. Right-click the device you want to terminate.
2. Choose **Delete Device** from the pop-up menu.
3. The Network Designer will remove the selected device from the NetMap Topology layout window and automatically delete all associated connectors.



*The **Delete Device** option will remove the device and all connections made to the device.*

Using Drag-n-Drop To Make Interface Connections Between Devices

The Network Designer supports five different types of interface connections: serial, Ethernet, Fast Ethernet, ISDN/PRI, and Frame Relay.

Selecting an interface connection type:

1. Left-click the plus sign next to **Available Connectors** to display all available connectors.
2. Drag and drop the selected connection type to the NetMap Topology physical layout window.

Fast Ethernet does not have its own connection item in the tree view. If a device has Fast Ethernet connections available, they can be accessed by selecting **Ethernet**. Because Frame Relay connections are point-to-multipoint serial connections, they must be selected from within the **Serial** connection type.

Note: A Make Connection Wizard is also available.

Setting Interface Connection Parameters

When you make certain physical device-to-device interface connections, a screen will appear asking you to set the connection parameters. Frame Relay and ISDN/PRI interface connections have parameters that can be set by the user. The parameters for these devices do not need to be set by the user because they are loaded with default values. However, if you wish to change these values and set the interface-connection parameters yourself, you can do so during this step. Alternatively, after the fact, you can do the following:

1. Right-click the **Frame Relay** (not ISDN) icon in the NetMap Topology physical layout window.
2. Click the **Set Parameters** option from the pop-up menu.
3. After making changes to the parameters in the **Set Parameters** window, click **OK** to close the window and return to the layout window.

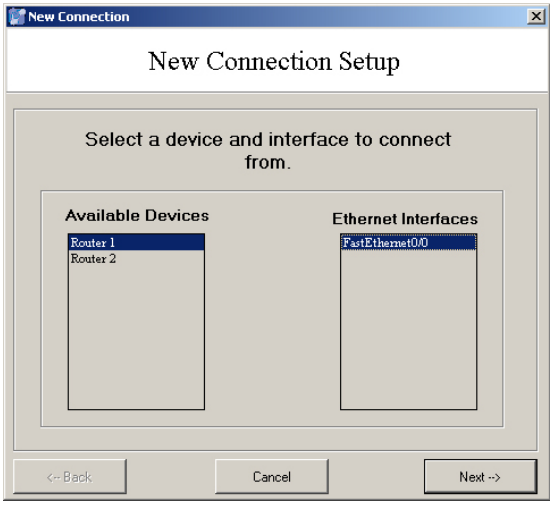
If you need to change the interface-connection parameters for ISDN, please delete and re-create the device in the NetMap Topology physical layout window.

Note: For additional information on PRI, please see the Sequential Labs.

Connecting Ethernet Between Devices

To manually connect Ethernet between devices, perform the following actions:

1. Left-click the Ethernet connection in order to add it.
2. The **New Connection** screen will appear listing all devices that have Ethernet ports correlating to the Ethernet connection type that you selected.
3. Select an Ethernet-capable device to connect from the **Available Devices** box.



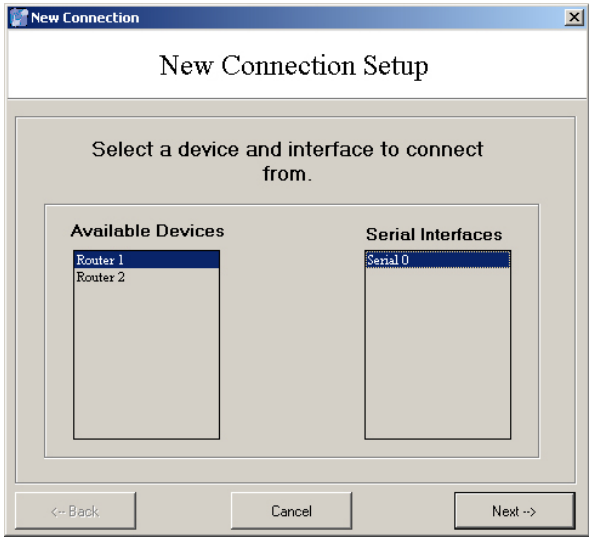
4. Select an interface from the **Ethernet Interfaces** box.
5. Repeat the process for other devices.
6. Click **Finish**.

If you are using the Make Connection Wizard, select **Ethernet** in order to be guided through the process of connecting Ethernet between devices.

Connecting Serial PPP Between Devices

To manually connect serial PPP between devices, perform the following actions:

1. Left-click the serial connection in order to add it.
2. Select the **Point-to-Point Serial connection (serial cable)** option.
3. The **New Connection** screen will appear listing all devices that have serial ports correlating to the serial connection type that was selected.
4. Select a serial-capable device to connect from the **Available Devices** box.

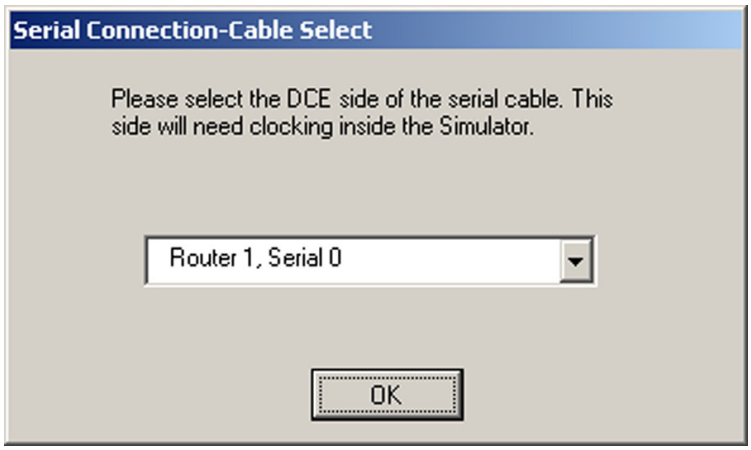


5. Select an interface from the **Serial Interfaces** box.
6. Repeat the process for other devices.
7. Click **Finish**.

If you are using the Make Connection Wizard, select **Serial** in order to be guided through the process of connecting serial PPP between devices.

Selecting DCE

Before the serial connection can be completed, one router must be designated as the data communications equipment (DCE) side of the connection:

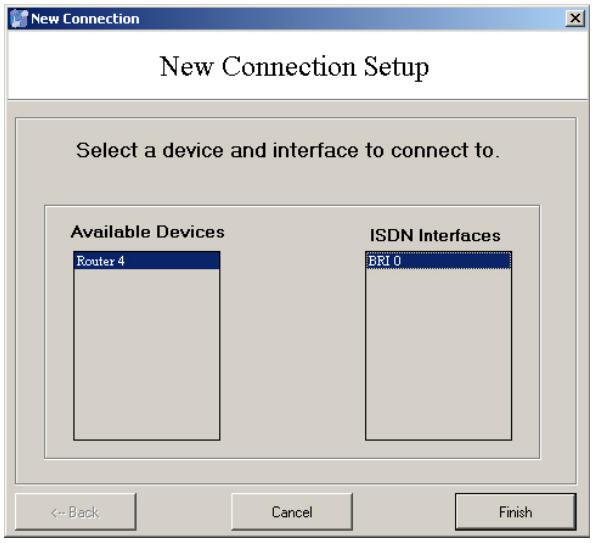

Serial Connection-Cable Select
Please select the DCE side of the serial cable. This side will need clocking inside the Simulator.
Router 1, Serial 0
OK

It is important to remember that the DCE device will need to have its clock rate set manually. **Note:** Frame Relay is configured separately.

Connecting ISDN Between Devices

To manually connect ISDN between devices, perform the following actions:

1. Left-click the ISDN connection in order to add it.
2. The New Connection screen will appear listing all devices that have ISDN ports correlating to the ISDN connection type that was selected.
3. Select an ISDN-capable device to connect from the Available Devices box.
4. Select an interface from the ISDN Interfaces box.
5. Repeat the process for other devices.
6. Click Finish.



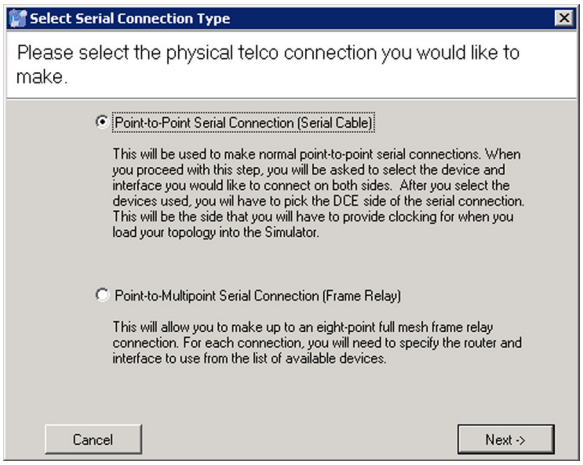
Note: PRI interfaces are also supported. See the Sequential Labs for more information.

If you are using the Make Connection Wizard, select **ISDN** in order to be guided through the process of connecting ISDN between devices.

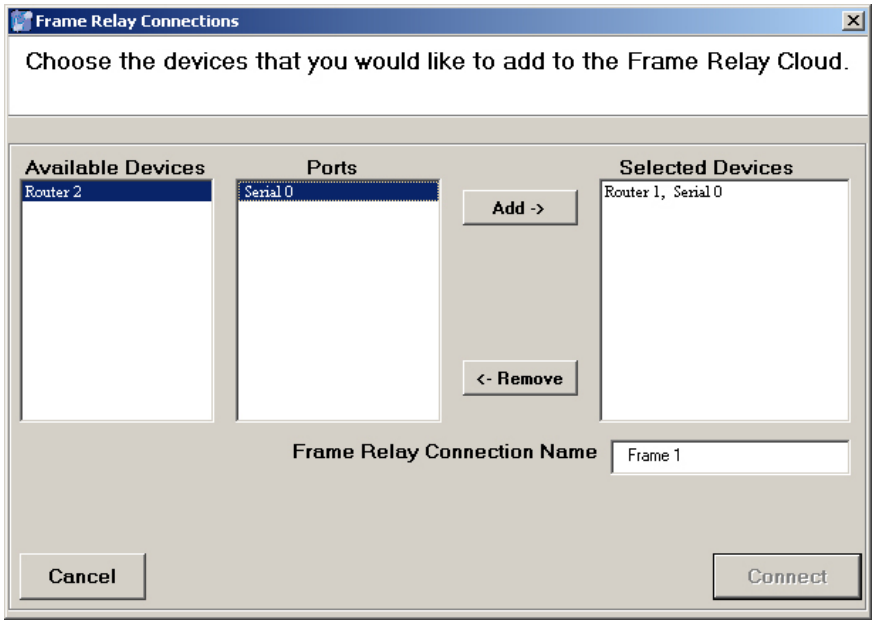
Connecting Multipoint Serial Between Devices

To manually connect Frame Relay interfaces, perform the following actions:

1. Select **Serial** from the **Available Connectors** list.
2. The Network Designer will ask what type of serial connection you want to make.
3. Select the **Point-to-Multipoint Serial Connection (Frame Relay)** option.


Select Serial Connection Type
Please select the physical telco connection you would like to make.
Point-to-Point Serial Connection (Serial Cable)
This will be used to make normal point-to-point serial connections. When you proceed with this step, you will be asked to select the device and interface you would like to connect on both sides. After you select the devices used, you wil have to pick the DCE side of the serial connection. This will be the side that you will have to provide clocking for when you load your topology into the Simulator.
Point-to-Multipoint Serial Connection (Frame Relay)
This will allow you to make up to an eight-point full mesh frame relay connection. For each connection, you will need to specify the router and interface to use from the list of available devices.
Cancel
Next >

4. Next, select the router you would like to connect from the **Available Devices** box.
5. Selecting a router will cause the **Ports** list to be populated with all available serial ports for the selected router.
6. After selecting the serial port that will be used, click the **Add** button to place the device and selected interface in the **Selected Devices** box.



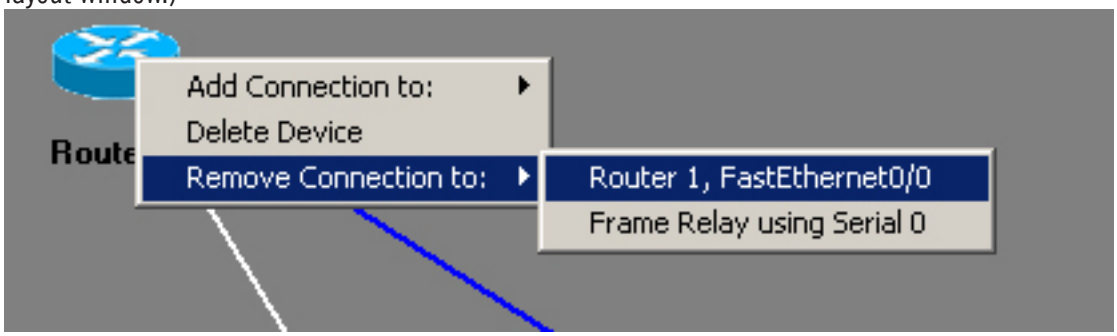
Repeat these actions for each router to be included in the Frame Relay cloud (up to eight routers maximum in full mesh). When you are finished adding devices, click the **Connect** button to complete the connection.

If you use the Make Connection Wizard, select **Serial**, and then click the multipoint option in order to be guided through the process.

Removing Connections

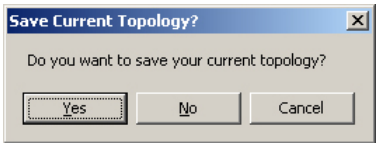
From within the NetMap Topology physical layout window, take the following actions to remove a connection:

1. Right-click the device from which you want to terminate a connection.
2. Choose **Remove Connection to:** from the pop-up menu.
3. Select the connection to be disconnected. (The connection will be removed from the NetMap Topology layout window.)



Clearing the Network Map

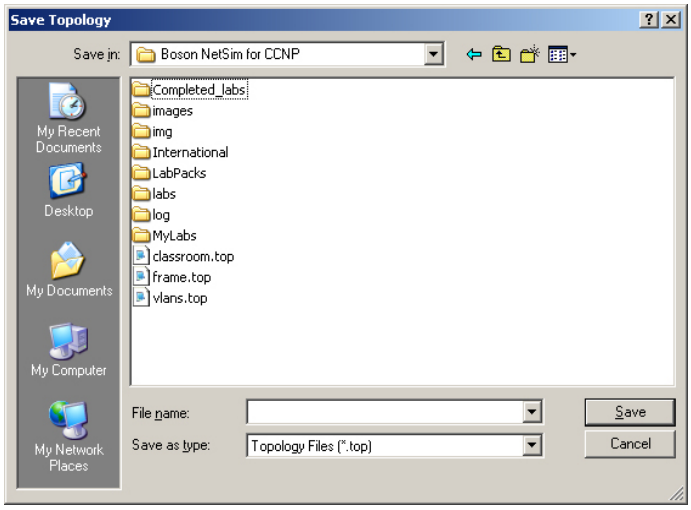
1. Click the **File** menu.
2. Select the **New** option from the menu. You will be asked whether you want to save your current topology.



3. Click **No** to erase the current topology.

Saving a Custom Topology

1. Click the **File** menu.
2. Click the **Save** or **Save As** option.
3. In the **Save Topology** window, name the file, and browse to the location where you would like to save the topology.
4. Click the **Save** button.



Note: Physical NetMap Topology files are saved as *.top.

Opening/Loading a Custom Topology

1. Click the **File** menu.
2. Select the **Open** option from the menu.
3. Browse to the location of your topology file.
4. Select the file you would like to open.
5. Click the **Open** button.

Printing the NetMap Topology

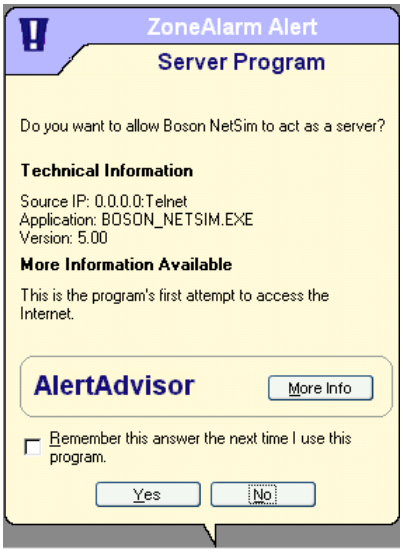
1. Click the **File** menu.
2. Choose the **Print** option.
3. Select which printer you want to send your image to; click **Preferences** to adjust the printing options.

Appendices

Appendix A: Tested Third-Party Firewalls

ZoneAlarm

If ZoneAlarm is installed on your computer, a warning message such as the following might appear when the Boson NetSim is first launched:

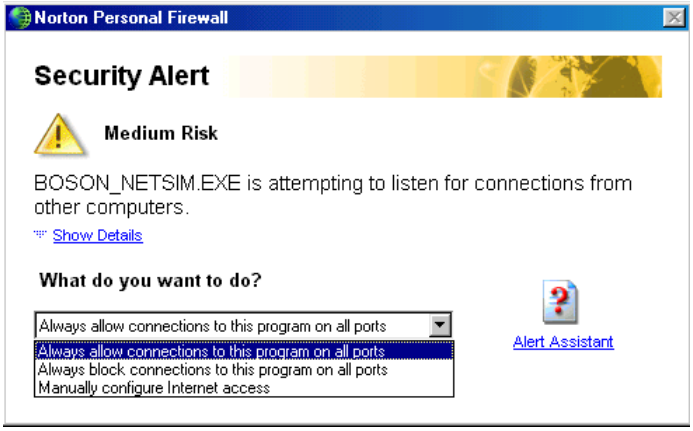


You must permit Telnet sessions to loopback IP address 127.0.0.1 (ZoneAlarm shows this as IP address 0.0.0.0) in order for the Simulator to function properly. Select the **Remember this answer the next time I use this program** check box, and then click the **Yes** button.

This third-party program was tested only so far as basic compatibility for use with the advanced features of the Boson NetSim. No other testing was performed by Boson.

Norton Personal Firewall

If Norton Personal Firewall is installed on your computer, an alert such as the following might appear when the Boson NetSim is first launched:


Norton Personal Firewall
Security Alert
Medium Risk
BOSON_NETSIM.EXE is attempting to listen for connections from other computers.
Show Details
What do you want to do?
Always allow connections to this program on all ports
Always allow connections to this program on all ports
Always block connections to this program on all ports
Manually configure Internet access
Alert Assistant

You should select the **Always allow connections to this program on all ports** option from the **What do you want to do?** drop-down list, and then click the **OK** button. This will give the program the ability to establish Telnet sessions. If you prefer to select the **Manually configure Internet access** option, you must permit loopback IP address 127.0.0.1 on Telnet port 23.

This third-party program was tested only so far as basic compatibility for use with the advanced features of the Boson NetSim. No other testing was performed by Boson.

Appendix B: Tested Telnet Programs

1. Absolute Telnet - No problems found
2. Telnet 2000 - No problems found
3. NetTerm - No problems found
4. Koala Term - No problems found
5. Tiny Term - No problems found

The above third-party programs were tested only so far as basic compatibility for use with the advanced features of the Boson NetSim. No other testing was completed by Boson.

Appendix C: Supported Devices

Fixed-Interface Routers

Series	Model	Fast Ethernet	Ethernet	Serial	ISDN
800	801	0	1	0	1
800	802	0	1	0	1
800	803	0	1	0	1
800	804	0	1	0	1
800	805	0	1	1	0
800	808	0	2	0	0
1000	1003	0	1	0	1
1000	1004	0	1	0	1
1000	1005	0	1	1	0
2500	2501	0	1	2	0
2500	2502	0	0	2	0
2500	2503	0	1	2	1
2500	2504	0	0	2	1
2500	2505	0	1	2	0
2500	2507	0	1	2	0
2500	2509	0	1	8	0
2500	2511	0	1	16	0
2500	2513	0	1	2	0
2500	2514	0	2	2	0
2500	2515	0	0	2	0
2500	2516	0	1	2	1
2500	2520	0	1	4	1
2500	2521	0	0	4	1
2500	2522	0	1	10	1
2500	2523	0	0	10	1

Slot-Based Routers

Series	Model	Slot Options	Available Interfaces
1600	1601	1	1s, 1b
1600	1602	1	1s, 1b
1600	1603	1	1s, 1b
1600	1604	1	1s, 1b
1600	1605	1	1s, 1b
1700	1720	2	1s, 2s, 1b, 1e
1700	1721	2	1s, 2s, 1b, 1e
1700	1750	2	1s, 2s, 1b, 1e
1700	1751	2	1s, 2s, 1b, 1e
1700	1760	2	1s, 2s, 1b, 1e
2600	2610	2	1s, 2s, 1b
2600	2611	2	1s, 2s, 1b
2600	2620	2	1s, 2s, 1b
2600	2621	2	1s, 2s, 1b
3600	3620	2	1e, 4e, 1e: 1s, 2e: 1s, 1f, 1f: 1b, 1f: 2b, 4s, 4b
3600	3640	4	1e, 4e, 1e: 1s, 2e: 1s, 1f, 1f: 1b, 1f: 2b, 4s, 4b
4500	4500	3	2e, 6e, 1f, 2s, 4s, 4b, 8b

Legend: e=Ethernet, s=serial, f=FastEthernet, b=ISDN/BRI

Switches and Stations

Series	Model	Fast Ethernet	Ethernet
1900	1912	2	12
2900	2950	12	0

Boson NetSim Support Stations

The emulated stations are simulated personal computers running the Boson Operating System Simulator (BOSS) command-line interface. The stations are PCs with one Ethernet connection each.

From within the command window, type **?** to display a list of available commands, or type **help** to display an overview. See the **Simulated Workstations** section of this document for more assistance.

Appendix D: File-Naming Conventions

The Boson NetSim engine uses the following file name extensions:

1. .nwc = Network Configuration. This file is the "glue" that links all of the .rtr running configuration files together when a snapshot of all network configurations is saved or loaded. You can only load the snapshot into the original corresponding unmodified topology.
2. .rtr = Router/Switch Configuration. This file is the saved running configuration of an individual router or switch device within the physical network map topology. Information such as the IP addresses of the individual device is stored in this file.
3. .top = Topology Configuration. This file is generated by the Network Designer and is used to describe the physical network map topology. Configurations such as ISDN, serial, and Ethernet wired connectivity are stored in this file.

The following third-party file name extensions are referenced:

1. .pdf = Portable Document Format (see www.adobe.com for details)
2. .txt = Generic ASCII text document (e.g., Microsoft Notepad)

Appendix E: Lab Compiler

You can use the Lab Compiler to add your own labs to the Lab Navigator.

Section 1: Overview

The Boson Lab Compiler is a feature of the Boson NetSim that enables the user to design labs that plug in to the Boson Lab Navigator. With the Lab Compiler, users can write their own labs, package them into a single .lab file, and distribute the labs to students or colleagues.

Section 2: Basics

The basics of this application are simple. First, create the following files for each lab to be included in the lab package:

1. Create the lab instructions in a .doc, .pdf, or .txt file.
2. Create the Network Design .top file in the Network Designer.
3. Create the Loading Network Configuration .nwc and .rtr files for each router if desired.
4. Create the Grading Network Configuration .nwc and .rtr files for each router if desired.
5. Include a lab image for display in Lab Navigator (this can be your company or school logo) if desired.

After all these files are created for each lab to be added, package each lab into its own .lab file. You can then send the lab package to friends or students to load into their Boson NetSim applications.

Section 3: Lab Creation Tutorial

The following section is a technical overview of how to create a lab, save it as a package, and load the package into the Lab Navigator.

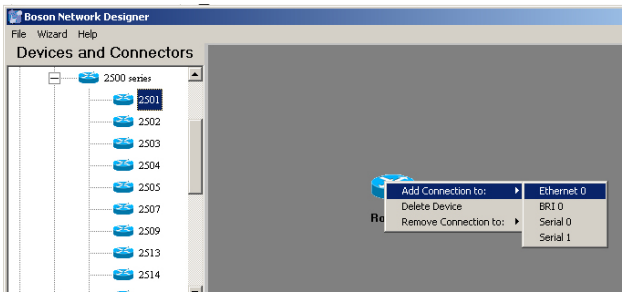
Step 1) Create a text document using Microsoft Notepad with instructions on how to complete the lab. For ex-

ample purposes, this file should include the following simple instructions:

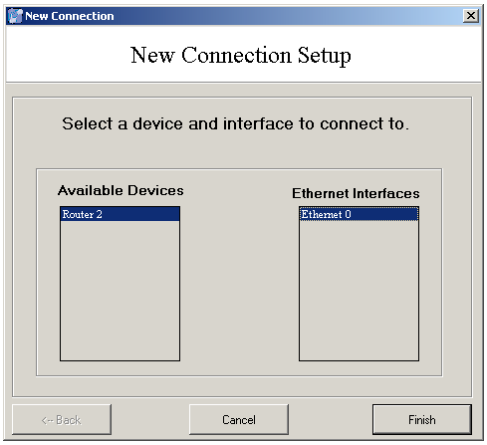
1. Set the host name to **R1** on Router 1.
2. Assign an IP address of 10.1.1.1 255.255.255.0 on Ethernet 0.

Save this file as instructions.txt on your desktop.

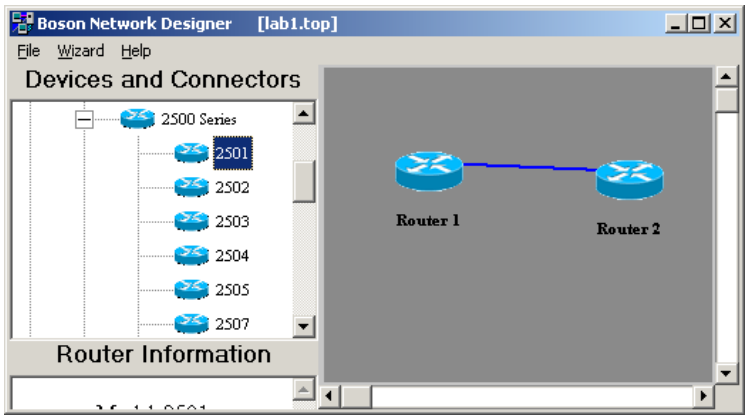
Step 2) Load the Network Designer (**Start->Programs->Boson Software->Boson NetSim for CCNP->Boson Network Designer**), and create your own network design. For the purposes of this tutorial, add two 2501 routers with their default names to the network. Right-click Router 1, select the **Add Connection to:** option, and select **Ethernet 0**.



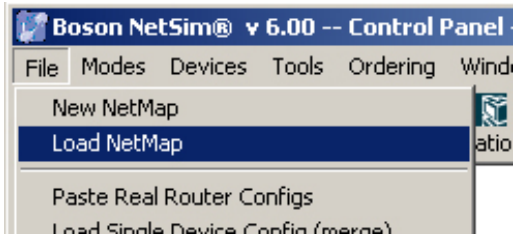
Step 3) In the resulting **New Connection** screen, select **Router 2** from the **Available Devices** list and **Ethernet 0** from the **Ethernet Interfaces** list, and then click **Finish**.



Step 4) Now, choose **Save** from the **File** menu. Save the file to your desktop, and call it lab1.top. Close the Boson Network Designer.



Step 5) Open the Boson NetSim for CCNP. Bypass the Lab Navigator by selecting the Boson NetSim v6.0 application in the taskbar at the bottom of the screen. Select **Load Netmap** from the **File** menu.



Step 6) Select the lab1.top file on your desktop, and click **Open**.

Step 7) For demonstration purposes, Router 2 will be loaded pre-configured as part of the loading configuration. Select **Router 2** from the **eRouters** menu.

Specify a host name of **R2** and an IP address of 10.1.1.2 255.255.255.0, and enable the interface.

```
Router>
Router>enable
Router#config t
Router(config)#hostname R2
R2(config)#int E0
R2(config-if)#ip add 10.1.1.2 255.255.255.0
R2(config-if)#no shut
```

Step 8) Use the **Save Multi Devices Configs** option from the **File** menu, name the file loading.nwc, and save it to the desktop. The loading configurations are now complete. Continue to create the grading configuration.

Step 9) Select **Router 1** from the **eRouters** menu. Configure a host name of **R1** and an IP address of 10.1.1.1 255.255.255.0, and enable the interface.

Router>
Router>enable
Router#config t
Router(config)#hostname R1
R1(config)#int EO
R1(config-if)#ip add 10.1.1.1 255.255.255.0
R1(config-if)#no shut

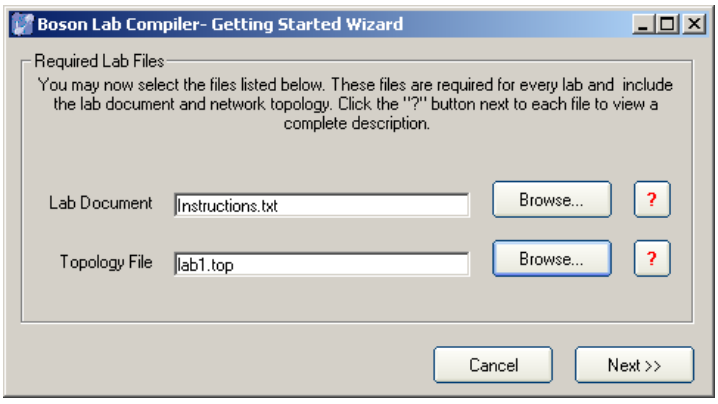
Step 10) Use the **Save Multi Devices Configs** option from the **File** menu, name the file grading.nwc, and save it to the desktop. The final grading configuration is now complete. These files will be used to determine whether the student has completed the lab properly. Close the Boson NetSim.

Step 11) All files have been created at this point. Open the Lab Compiler (**Start->Programs->Boson Software->Boson NetSim for CCNP->Boson Lab Compiler**), and fill in the following information in the corresponding text boxes in the Boson Lab Compiler – Getting Started Wizard.

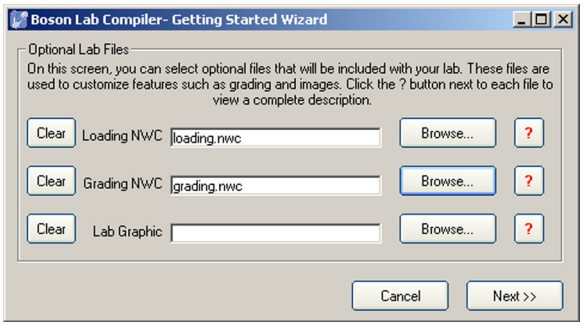
Tab Title: Testing
Section Title: Demo
Lab Title: Lab1

Step 12) For the lab document, click the **Browse** button and, on the resulting screen, change the **Files of type** to **Text File [*.txt]**. Now, select the instructions.txt file on your desktop.

Click **Browse** next to the **Topology File** field, and select lab1.top on your desktop. When you are finished, the screen should look like the screen below. Click the **Next** button.

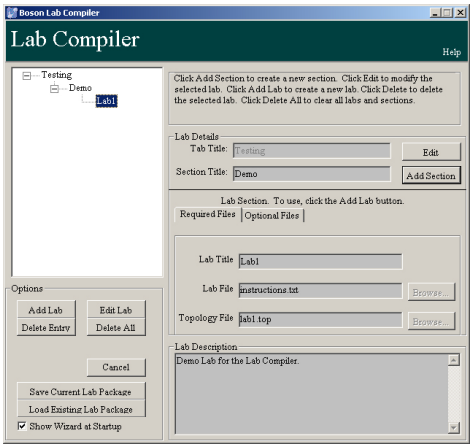

Boson Lab Compiler- Getting Started Wizard
Required Lab Files
You may now select the files listed below. These files are required for every lab and include the lab document and network topology. Click the "?" button next to each file to view a complete description.
Lab Document
Instructions.txt
Browse...
?
Topology File
lab1.top
Browse...
?
Cancel
Next >>

Step 13) Click **Browse** next to the **Loading NWC** field, and select the loading.nwc file on your desktop. Click **Browse** next to the **Grading NWC** field, and select the grading.nwc file on your desktop. When you are finished, the screen should look like the screen below. Click the **Next** button.



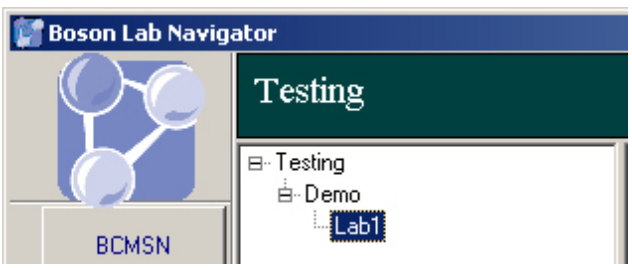
Step 14) In the **Lab Description** text box, type "Demo Lab for the Lab Compiler", and click the **Next** button. Click **Finish** to complete the addition of Lab1.

Step 15) You are now ready to create the lab package. In the screen below, you can see the lab you created on the left in a hierarchical view. If you were to add more labs, they would be displayed here also. To create the lab package, click the **Save Current Lab Package** button. Save the file name as Lab1Pack.lab on your desktop.



Step 16) Close the Lab Compiler, and open the Boson NetSim. When the NetSim loads, the Lab Navigator should load to the front. On the Lab Navigator, click the **Add Tab** button, which is located in the navigation bar at the top of the page.

Locate the Lab1Pack.lab file on your desktop, and click **Open**. You will see a button named **Testing** appear in the menu on the left. You can now use your lab just as you would any other lab within the Lab Navigator.

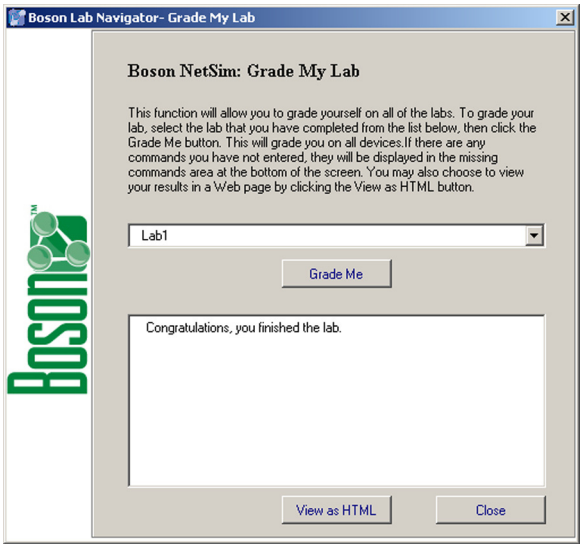


Section 4: Verifying That the Lab Works

To verify that the lab works properly in the Simulator, double-click **Lab1**. A new window will appear with the lab name and lab description on it.

Click the **View Lab** button to load the instructions for the lab. Double-click **Lab1** again, click the **Load Lab** button, and click **Yes** when asked if you want the lab information to be loaded into the Simulator. Click **OK** when asked if you want to continue. When the program is finished, you will be looking at Router 1.

To complete the lab, select **Router 1** from the **eRouters** drop-down menu. In the Router 1 interface, configure the host name to R1 and the IP address on Ethernet 0 to 10.1.1.1 255.255.255.0. When you are finished, switch back to the Lab Navigator and click the **Grade Lab** button. Make sure the correct lab is selected for grading. Click the **Grade Me** button. If you completed the lab correctly, you will receive the message depicted in the screen below.


Boson Lab Navigator- Grade My Lab
Boson NetSim: Grade My Lab
This function will allow you to grade yourself on all of the labs. To grade your lab, select the lab that you have completed from the list below, then click the Grade Me button. This will grade you on all devices.If there are any commands you have not entered, they will be displayed in the missing commands area at the bottom of the screen. You may also choose to view your results in a Web page by clicking the View as HTML button.
Lab1
Grade Me
Congratulations, you finished the lab.
View as HTML
Close

As you can see, the Lab Compiler offers many opportunities to add your own labs to the program and then distribute them to students or friends.

If you have any questions regarding the Lab Compiler, please email netsim@boson.com.